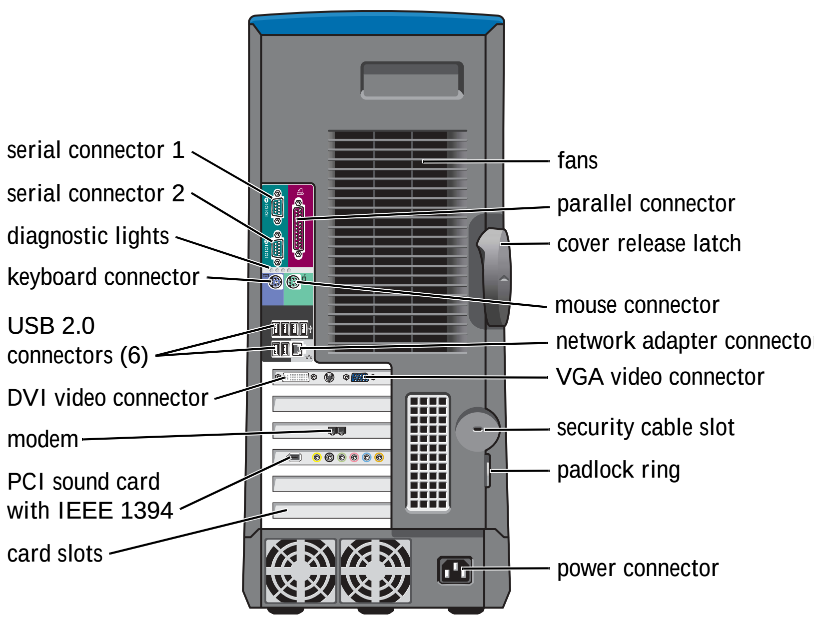
Dell™ Dimension™ XPS





Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the *Dell™ Dimension™ Help* file. To access help files, see page 38.

Model WHL

June 2003 P/N G0550 Rev. A01

Contents

2 Optimizing Performance

3 Solving Problems

Finding Information for Your Computer

Dell provides the following support options to help you quickly find answers to your questions and problems:

- Dell Solution Center — Double-click the Dell Solutions Center icon on your Microsoft® Windows® desktop for documentation, tools, troubleshooting information, and links to online support resources.
- Dell Support on your Windows desktop (U.S. only) — From the Dell Solution Center, click **Dell Support** for additional documentation, tools, and troubleshooting information.
- Dell Support on the Internet — The Dell Support website (**support.dell.com**) provides online tools, including a Knowledge Base, Frequently Asked Questions, Hints and Tips, Software Reinstall Guides, Dell Community Forums, and Dell Customer Care.
- Dell Technical Support — E-mail or call technical support personnel for Dell hardware or operating system issues that you cannot resolve using the Dell Support options.

Use the following chart to determine where you can find information on a particular topic.

What are you looking for?	Find It Here
• How to access tutorials and other how to information • How to get a copy of my invoice • How to extend my warranty • How to access Dell Support on my Windows desktop (U.S. only) • Additional documentation, tools, troubleshooting information, and links to online support resources	**Dell Solution Center**  On your Windows desktop

What are you looking for?	Find It Here
• Latest drivers for my computer • Answers to technical service and support questions • Online discussions with other users and technical support • Documentation for my computer	**Dell Support Website — support.dell.com** The Dell Support website provides several online tools, including: • Solutions — Troubleshooting hints and tips, articles from technicians, and online courses • Community Forum — Online discussion with other Dell customers • Upgrades — Upgrade information for components, such as memory, the hard drive, and the operating system • Customer Care — Contact information, order status, warranty, and repair information • Downloads — Drivers, patches, and software updates • Reference — Computer documentation, product specifications, and white papers
• How to set up my computer	**Setup Diagram** 
• Additional information about setting up my computer • How to troubleshoot and solve problems • How to remove and install parts • Technical specifications • How to contact Dell	**Owner's Manual** 

What are you looking for?	Find It Here
• Tips on using Windows • How to play CDs and DVDs • How to use standby mode and hibernate mode • How to change my display resolution • How to clean my computer	**Dell™ Dimension™ Help File** **1** Click the **Start** button and click **Help and Support**. **2** Click **User and system guides** and click **User's guides**. **3** Click **Dell™ Dimension™ Help**.
• How to use Windows • Documentation for my computer • Documentation for devices (such as a modem)	**Windows Help and Support Center** **1** Click the **Start** button and click **Help and Support**. **2** Type a word or phrase that describes your problem and click the arrow icon. **3** Click the topic that describes your problem. **4** Follow the instructions on the screen.
• A diagnostic program for my computer • Drivers for my computer • My computer documentation • My device documentation	**ResourceCD**  Documentation and drivers are already installed on your computer when shipped from Dell. You can use the CD to reinstall drivers (see page 67), run the Dell Diagnostics (see page 64), or access your documentation. Readme files may be included on your CD to provide last-minute updates about technical changes to your computer or advanced technical-reference material for experienced users or technicians.
• How to reinstall my operating system	**Operating System CD**  Windows XP is already installed on your computer when shipped from Dell. You can use the CD to reinstall the operating system (see page 72). After you reinstall your operating system using the Operating System Reinstallation CD, use the ResourceCD to reinstall drivers for the devices that came with your computer. The product key for your operating system is located on your computer.

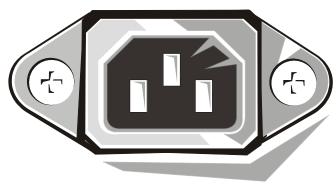
What are you looking for?	Find It Here
• Service Tag and Express Service Code • Microsoft® Windows® License Label	**Service Tag and Microsoft Windows Label**  These labels are located on your computer. • Use the Service Tag to identify your computer when you access Dell Support or when you contact Dell for technical assistance. • Enter the Express Service Code into the automated call-routing system when you contact Dell for technical assistance. Express Service Code service may not be available in some countries. • Use the number on the Windows License Label if you reinstall Windows on your computer.

⚠ CAUTION: Safety Instructions

Use the following safety guidelines to help ensure your own personal safety and to help protect your computer and working environment from potential damage.

General

- Do not attempt to service the computer yourself unless you are a trained service technician. Always follow installation instructions closely.
- To help prevent electric shock, plug the computer and device power cables into properly grounded electrical outlets. These cables are equipped with 3-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a 3-wire cable with properly grounded plugs.



- To help avoid the potential hazard of electric shock, do not use your computer during an electrical storm.
- To help avoid the potential hazard of electric shock, do not connect or disconnect any cables or perform maintenance or reconfiguration of this product during an electrical storm.
- If your computer includes a modem, the cable used with the modem should be manufactured with a minimum wire size of 26 American wire gauge (AWG) and an FCC-compliant RJ-11 modular plug.
- Before you clean your computer, disconnect the computer from the electrical outlet. Clean your computer with a soft cloth dampened with water. Do not use liquid or aerosol cleaners, which may contain flammable substances.
- To help avoid possible damage to the system board, wait 5 seconds after turning off the computer before disconnecting a device from the computer.

CAUTION: Safety Instructions *(continued)*

- To avoid shorting out your computer when disconnecting a network cable, first unplug the cable from the network adapter on the back of your computer, and then from the network jack. When reconnecting a network cable to your computer, first plug the cable into the network jack, and then into the network adapter.
- To help protect your computer from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Ensure that nothing rests on your computer's cables and that the cables are not located where they can be stepped on or tripped over.
- Do not push any objects into the openings of your computer. Doing so can cause fire or electric shock by shorting out interior components.
- Keep your computer away from radiators and heat sources. Also, do not block cooling vents. Avoid placing loose papers underneath your computer; do not place your computer in a closed-in wall unit or on a bed, sofa, or rug.

When Using Your Computer

As you use your computer, observe the following safe-handling guidelines.

CAUTION: Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, and so on) removed.

- Your computer is equipped with one of the following:
  - A fixed-voltage power supply — Computers with a fixed-voltage power supply do not have a voltage selection switch on the back panel and operate at only one voltage (see the regulatory label on the outside of the computer for its operating voltage).
  - An auto-sensing voltage circuit — Computers with an auto-sensing voltage circuit do not have a voltage selection switch on the back panel and automatically detect the correct operating voltage.
  - A manual voltage selection switch — Computers with a voltage selection switch on the back panel must be manually set to operate at the correct operating voltage.



Set the switch to the position that most closely matches the voltage used in your location.

NOTICE: To help avoid damaging a computer with a manual voltage selection switch, set the switch for the voltage that most closely matches the AC power available in your location. For Japan, the voltage selection switch must be set to the 115-V position even though the AC power available in Japan is 100 V. Also, ensure that your monitor and attached devices are electrically rated to operate with the AC power available in your location.

- Before working inside the computer, unplug the computer to help prevent electric shock or system board damage. Certain system board components continue to receive power any time the computer is connected to AC power.

When Using Your Computer *(continued)*

When Working Inside Your Computer

Before you open the computer cover, perform the following steps in the sequence indicated.

CAUTION: Do not attempt to service the computer yourself, except as explained in your online Dell™ documentation or in instructions otherwise provided to you by Dell. Always follow installation and service instructions closely.

NOTICE: To help avoid possible damage to the system board, wait 5 seconds after turning off the computer before removing a component from the system board or disconnecting a device from the computer.

1. Perform an orderly computer shutdown using the operating system menu.
2. Turn off your computer and any devices connected to the computer.
3. Ground yourself by touching an unpainted metal surface on the chassis, such as the metal around the card-slot openings at the back of the computer, before touching anything inside your computer.

   While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.
4. Disconnect your computer and devices, including the monitor, from their electrical outlets. Also, disconnect any telephone or telecommunication lines from the computer.

   Doing so reduces the potential for personal injury or shock.

In addition, take note of these safety guidelines when appropriate:

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

When Using Your Computer *(continued)*

- Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a microprocessor chip by its edges, not by its pins.

CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Do not dispose of the battery along with household waste. Contact your local waste disposal agency for the address of the nearest battery deposit site.

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch any of your computer's electronic components, such as the microprocessor. You can do so by touching an unpainted metal surface on the computer chassis.

As you continue to work inside the computer, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- Do not remove components from their antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, discharge static electricity from your body.
- When transporting an electrostatic sensitive component, first place it in an antistatic container or packaging.
- Handle all electrostatic sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

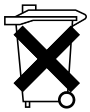
Ergonomic Computing Habits

CAUTION: Improper or prolonged keyboard use may result in injury.

CAUTION: Viewing the monitor screen for extended periods of time may result in eye strain.

For comfort and efficiency, observe the ergonomic guidelines in the *Dell™ Dimension™ Help* file when setting up and using your computer. To access the help file, see page 38.

When Using Your Computer *(continued)*



Battery Disposal

Your computer uses a lithium coin-cell battery. The lithium coin-cell battery is a long-life battery, and it is very possible that you will never need to replace it. However, should you need to replace it, see page 115.

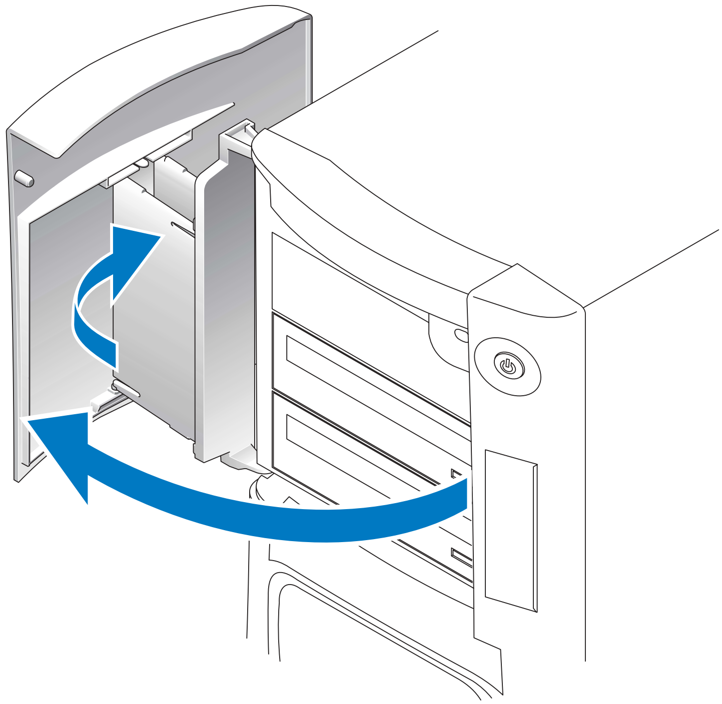
Do not dispose of the battery along with household waste. Contact your local waste disposal agency for the address of the nearest battery deposit site.

1

SECTION 1

Using Your Computer

Opening the Drive Door



Connecting Two Monitors

NOTE: If you are connecting two monitors that have VGA connectors, you must have the optional VGA adapter. If you are connecting two flat-panel monitors, at least one of them must have a VGA connector. If you are connecting a television, you may connect only one monitor (VGA or DVI) in addition to the television.

If you purchased a video card that supports dual monitors, follow these instructions to connect and enable your monitors. The instructions tell you how to connect either two monitors (each with a VGA connector), one monitor with a VGA connector and one monitor with a DVI connector, or a television.

1 Save any open files, close any open programs, and then shut down your computer through the **Start** menu (see page 30).

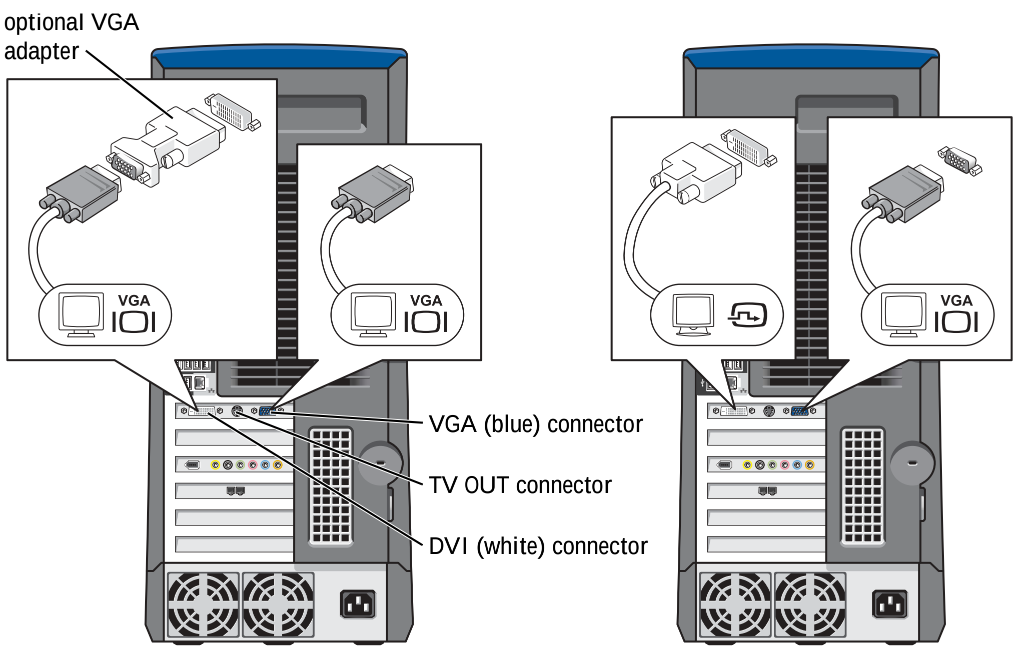
2 Connect the monitor cables to the connectors on the back of the computer.

NOTE: If your computer has integrated video, do not connect either monitor to the integrated video connector.

If both monitors have VGA connectors:

a Connect one of the monitors to the VGA (blue) connector on the computer.

b Connect the other monitor to the optional VGA adapter and connect the VGA adapter to the DVI (white) connector on the computer.



If one monitor has a VGA connector and the other one has a DVI connector:

a Connect the VGA connector on the monitor to the VGA (blue) connector on the computer.

b Connect the DVI connector on the other monitor to the DVI (white) connector on the computer.

NOTE: To connect a television to your computer, you must purchase an S-video cable, which is available at most consumer electronics stores. An S-video cable is not included with your computer.

If one of the monitors is a television:

a Connect one end of the S-video cable to the TV-OUT connector on the computer.

b Connect the other end of the S-video cable to the S-video input connector on your television.

a Connect the VGA or DVI monitor as described on page 21.

3 Turn on the computer.

The Microsoft® Windows® desktop displays on the primary monitor.

4 Enable clone mode or extended desktop mode in the display settings.

- In clone mode, both monitors display the same image.
- In extended desktop mode, you can drag objects from one screen to the other, effectively doubling the amount of viewable work space.

For information on changing the display settings for your video card, see the user's guide in the Help and Support Center (click the **Start** button, click **Help and Support**, click **User and system guides**, click **Device guides**, and then click the guide for your video card).

Configuring Graphics Cards

Settings and Functions

Dell configured your graphics card for optimal performance with most games and other video programs. However, some game manufacturers may recommend that you either change a setting or enable or disable a certain function for a game to properly run. You may also want to readjust settings to better fit your gaming style.

Some settings, such as Direct3D or OpenGL, enable you to adjust the card for higher performance or for higher image quality. Other settings, such as contrast or color level, are cosmetic adjustments.

Certain high-end graphics cards are available with TV-Out support, which enables you to connect a television to your computer, in addition to the monitor. A TV-Out configuration is ideal for watching movies using an optional DVD player or for giving presentations. For information on connecting a television to your computer, see page 20.

For information and instructions on adjusting your graphics card's operating mode, settings, and functions:

1. Click the **Start** button and click **Help and Support**.
2. Click **User and system guides**.
3. Locate and click the guide for your graphics card.

Removing the Graphics Card Driver

If you want to install a different graphics card in your computer, you must first remove the driver for the graphics card that is currently installed. To remove a graphics card driver:

1. Click the **Start** button and click **Control Panel**.
2. Double-click **Add or Remove Programs**.
3. Click the name of the graphics card in the **Currently installed programs** list.
4. Click **Change/Remove** and follow the instructions on the screen.

After the driver is removed, install the new card (see "AGP Cards" on page 93), and then install the new card's driver according to the documentation that came with the card.

NOTE: If you reinstall the graphics card that came with your computer, the card's drivers are located on the *Dell Dimension ResourceCD* (see "Drivers" on page 67 for more information).

About Serial ATA Drives

Your Dimension™ XPS computer is compatible with both IDE and serial ATA hard drives. Serial ATA drives provide the following benefits by transferring data using serial technology and flexible cables that are thinner and longer than IDE cables:

- Improved cable routing facilitates more efficient airflow inside the chassis.
- Compact cable connectors save space on the system board and on the hard drive. Combined with the improved cable routing, this allows a more efficient utilization of space inside the chassis.

See "Hard Drive" on page 96 for information on serial ATA drive connections.

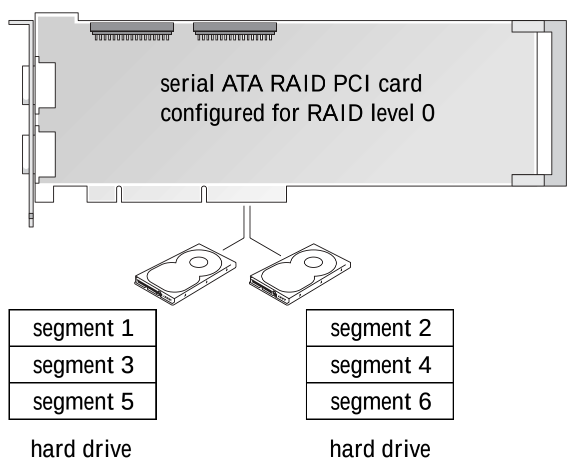
About Your RAID Configuration

If you purchased the optional serial ATA RAID PCI card and RAID configuration, your computer is already set up and ready for operation. This section provides an overview of the RAID configuration that you selected when you purchased your computer. Although there are several RAID configurations available in the computer industry for different types of uses, Dell offers either RAID level 0 or RAID level 1 on the Dimension XPS computer. A RAID level 0 configuration is recommended for high-performance gaming, and a RAID level 1 configuration is recommended for the data integrity requirements for digital photography and audio.

NOTE: RAID levels do not represent a hierarchy. A RAID level 1 configuration is not inherently better or worse than a RAID level 0 configuration.

RAID Level 0

RAID level 0 uses a storage technique known as "data striping" to provide a high data access rate. Data striping is a method of writing consecutive segments, or stripes, of data sequentially across the physical drives to create a large virtual drive. Data striping allows one of the drives to read data while the other drive is searching for and reading the next block.

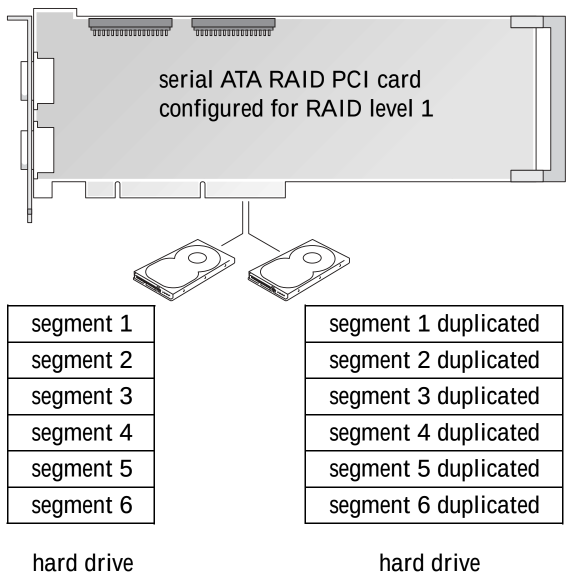


Another advantage of a RAID level 0 configuration is that it utilizes the full capacities of the drives. If you have two 120-GB drives installed, you have 240 GB on which to store data.

NOTICE: Because RAID level 0 provides no data redundancy, if one drive fails, then the data on the other drive is also inaccessible. Therefore, ensure that you perform regular backups when you use a RAID level 0 configuration.

RAID Level 1

RAID level 1 uses a data-redundancy storage technique known as "mirroring." When data is written to the primary drive, it is then duplicated, or mirrored, on the other drive. A RAID level 1 configuration sacrifices high data access rates for its data redundancy advantages.



If a drive failure occurs, subsequent read and write operations are directed to the surviving drive. A replacement drive can then be rebuilt using the data from the surviving drive. Also, because data is duplicated on both drives, two 120-GB RAID level 1 drives collectively have a maximum of 120-GB on which to store data.

Transferring Information to a New Computer

The Microsoft® Windows® XP operating system provides a Files and Settings Transfer wizard to move data from the source computer to the new computer. You can move data such as:

- E-mails
- Toolbar settings
- Window sizes
- Internet bookmarks

You can transfer the data to the new computer over a network or serial connection, or you can store it on a removable medium, such as a writable CD or floppy disk.

To prepare the new computer for the file transfer:

1. Click the **Start** button, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **Files and Settings Transfer Wizard**.
2. When the **Files and Settings Transfer Wizard** welcome screen appears, click **Next**.
3. On the **Which computer is this?** screen, click **New Computer** and click **Next**.
4. On the **Do you have a Windows XP CD?** screen, click **I will use the wizard from the Windows XP CD** and click Next.
5. When the **Now go to your old computer** screen appears, go to your old or source computer. *Do not* click **Next** at this time.

To copy data from the old computer:

1. On the old computer, insert the Windows XP *Operating System* CD.
2. On the **Welcome to Microsoft Windows XP** screen, click **Perform additional tasks**.
3. Under **What do you want to do?**, click **Transfer files and settings**.
4. On the **Files and Settings Transfer Wizard** welcome screen, click **Next**.
5. On the **Which computer is this?** screen, click **Old Computer** and click **Next**.
6. On the **Select a transfer method** screen, click the transfer method you prefer.
7. On the **What do you want to transfer?** screen, select the items you want to transfer and click **Next**.

   After the information has been copied, the **Completing the Collection Phase** screen appears.
8. Click **Finish**.

To transfer data to the new computer:

1. On the **Now go to your old computer** screen on the new computer, click **Next**.
2. On the **Where are the files and settings?** screen, select the method you chose for transferring your settings and files and click **Next**.

   The wizard reads the collected files and settings and applies them to your new computer.

   When all of the settings and files have been applied, the **Finished** screen appears.
3. Click **Finished** and restart the new computer.

Copying CDs

NOTE: Ensure that you follow all copyright laws when you create CDs.

This section applies only to computers that have a CD- or DVD-recording device.

The information in this section is based on the Roxio Easy CD Creator Basic documentation that came with your computer. See the following section, "Using Easy CD Creator Basic," for instructions on how to locate that documentation.

NOTE: The information in this section also applies to using Easy CD Creator Basic with a DVD+RW or a DVD+R drive.

To burn CDs, you need to use CD-burner software. Roxio Easy CD Creator Basic is your computer's CD-burner software. The software includes the following project programs that enable you to record specialty CDs for different types of uses:

- DirectCD allows you to format a blank CD-R or CD-RW disc so that you can use Microsoft® Windows® Explorer to drag and drop data files to the CD-RW drive. You can use a DirectCD-formatted CD-RW disc like another hard drive on your computer because CD-RW discs are fully rewritable (CD-R discs can be used with DirectCD, but that media type has overwriting limitations—see "Using Blank CD-R Discs or Blank CD-RW Discs" for recording media differences).
- MusicCD allows you to burn custom music CDs.
- DataCD allows you to copy a variety of your documents, such as spreadsheet or accounting files, to a CD for permanent storage.

NOTE: Some music and game CDs are copy-protected. If you have a CD that cannot be copied, you must use the original CD for everyday use.

- Disc Copier allows you to make a backup copy of almost any type of CD. This program allows you to make a copy of a CD for everyday use so that you can archive and save the original copy. (Disc Copier is titled "CD Copier" in some versions of Roxio CD Creator Basic.)

All four project programs are available on the Easy CD Creator Basic **Select a Project** menu screen. To view the **Select a Project** menu screen, click the **Start** button, point to **All Programs**→ **Roxio Easy CD Creator**, and then click **Project Selector**.

Using Easy CD Creator Basic

See the Easy CD Creator Basic documentation for instructions on how to use the program, information about different recording techniques, and CD media limitations. The Easy CD Creator Basic documentation is located in the Microsoft® Windows® XP Help and Support Center (see "Finding Help Information" on page 38). The documentation is also provided on the *Dell Dimension ResourceCD*, which is included with your computer. Each Easy CD Creator Basic project program also has thorough online help files.

Using Blank CD-R Discs or Blank CD-RW Discs

Your CD-RW drive writes to two different types of recording media—CD-R and CD-RW discs. Use blank CD-R (CD-Recordable) disks to record music or permanently store data files. After creating a CD-R disc, you cannot write to that disc again without changing your method of recording (see the Roxio documentation for more information). Use blank CD-RW
(CD-ReWritable) discs when you want to write, erase, rewrite, and update your files onto CDs.

Helpful Tips

- You must use the Easy CD Creator Basic project programs to copy and record all music and data CDs. You can use Windows Explorer to drag and drop files to a CD-R or CD-RW disc only after you first use DirectCD to format the disc.
- You must use CD-R discs to burn music CDs that you want to play in regular stereos. CD-RW discs do not play in most home or car stereos.
- If you want to copy files from the Internet or files from a floppy or Zip drive, copy those files to your hard drive first, and then burn your CD. Your CD-RW drive requires a steady stream of data to properly record. Direct Internet downloads, floppy drives, and Zip drives may not be able to provide a steady data stream to your CD-RW drive.
- Music MP3 files can be played only on MP3 players or on computers that have MP3 software installed.
- Ensure that you set the sampling rate to at least 128 Kbps when you burn MP3 files to a CD. Otherwise, recording errors may occur.
- Do not burn a blank CD-R or CD-RW disc to its maximum capacity; for example, do not copy a 650-MB file to a 650-MB blank CD. The CD-RW drive needs 1 or 2 MB of the blank CD to finalize the recording.

- Use a blank CD-RW disc to practice CD recording until you are familiar with CD recording techniques. If you make a mistake, you can erase the CD-RW disc and try again. You can also use blank CD-RW discs to test music file projects before you record the project permanently to a blank CD-R disc.
- See the Roxio support website at **support.roxio.com** for additional helpful tips.

How to Copy a CD

NOTE: If you have a DVD/CD-RW combo drive and you experience recording problems, first check for available software patches at the Dell Support website at support.dell.com and if necessary, the Roxio support website at support.roxio.com.

The procedure assumes that your computer is equipped with a single CD-RW drive (without an additional CD drive). If your computer is equipped with both types of drives, see the Roxio documentation for instructions on how to copy CDs from a CD drive to a CD-RW drive.

1. Click the **Start** button, point to **All Programs**→ **Roxio Easy CD Creator**, and then click **Project Selector**.

   The **Select a Project** window appears.

2. Click **Disc Copier**. (Disc Copier is titled "CD Copier" in some versions of Easy CD Creator Basic.)

   The **Disc Copier** window appears and displays your CD-RW drive in the **Copy from** and the **Record to** lists.

3. Insert the source CD that you want to copy into the CD-RW drive.

   The Disc Copier project program briefly checks the source CD in the CD-RW drive to ensure that it is a readable CD.

4. Click **Copy**.

   Depending on the size of the files that are being copied, the copy process may take a few minutes.

5. After the source CD is copied, remove the source CD from the CD-RW drive tray.

   The CD-RW drive tray opens automatically after the source CD is copied.

NOTE: You must use CD-R discs to burn music CDs that you want to play in regular stereos. CD-RW discs do not play in most home or car stereos.

6 Insert a blank CD into the CD-RW drive and close the tray.

The recording starts automatically.

7 After the recording completes, click **OK**.

Network Setup Wizard

The Microsoft® Windows® XP operating system provides a Network Setup Wizard to guide you through the process of sharing files, printers, or an Internet connection between computers in a home or small office.

1 Click the **Start** button, point to **All Programs**→ **Accessories**→ **Communications**, and then click **Network Setup Wizard**.

2 On the welcome screen, click **Next**.

3 Click **Checklist for creating a network**.

NOTE: Selecting the connection method This computer connects directly to the Internet enables the integrated firewall provided with Windows XP.

4 Complete the checklist and required preparations.

5 Return to the Network Setup Wizard and follow the instructions on the screen.

Turning Off Your Computer

NOTICE: To avoid losing data, turn off your computer by performing a Microsoft® Windows® operating system shutdown, as described next, rather than by pressing the power button.

1 Save and close any open files, exit any open programs, click the **Start** button, and then click **Turn Off Computer**.

2 In the **Turn off computer** window, click **Turn off**.

The computer turns off after the shutdown process finishes.

2

SECTION 2

Optimizing Performance

Intel® Performance Acceleration Technology

DDR Memory and Processor Front-Side Bus

Hyper-Threading

Overclocking

Intel® Performance Acceleration Technology

Your Dimension™ XPS computer is equipped with the Intel® 875P chipset, which utilizes Performance Acceleration Technology (PAT). PAT is designed to optimize performance by reducing the latency between DDR 400 memory and 800 front-side bus processors, and helps provide high performance to meet the requirements for today's demanding software.

DDR Memory and Processor Front-Side Bus

The performance of your computer's DDR memory depends on the type of memory installed and the clock speed of your processor. The following table indicates the memory performance resulting from different combinations of memory and front-side bus:

Memory type	800 front-side bus processor	533 front-side bus processor
DDR 400 (PC3200)	performs at 400 MHz	performs at 333 MHz
DDR 333 (PC2700)	performs at 320 MHz	performs at 333 MHz

For information on installing memory, see page 86. For information on the type of memory supported by your computer, see "Memory" on page 120.

Hyper-Threading

NOTE: Hyper-Threading is supported only on computers that have 3.06-GHz (or higher) microprocessors installed.

Hyper-Threading is an Intel® technology that can enhance overall computer performance by allowing one physical microprocessor to function as two logical microprocessors, capable of performing certain tasks simultaneously. It is recommended that you use the Microsoft® Windows® XP operating system because Windows XP is optimized to take advantage of Hyper-Threading technology. While many programs can benefit from Hyper-Threading, some programs have not been optimized for Hyper-Threading and may require an update from the software manufacturer. Contact the software manufacturer for updates and information about using Hyper-Threading with your software.

To determine if your computer is using Hyper-Threading technology:

1 Click the **Start** button, right-click **My Computer**, and then click **Properties**.
2 Click **Hardware** and click **Device Manager**.
3 In the **Device Manager** window, click the plus (+) sign next to the processor type. If Hyper-Threading is enabled, the processor is listed twice.

You can enable or disable Hyper-Threading through the system setup program. For more information on accessing the system setup program, see page 124. For more information on Hyper-Threading, search the Knowledge Base on the Dell Support website at **support.dell.com**.

Overclocking

Dell locks the microprocessor multiplier options in the system setup program to prevent processor overclocking. The first and most important reason for preventing overclocking is that Dell's performance labs vigorously test and fine-tune Dell computers at the system level in an attempt to attain the best possible overall performance. Any performance modification that is not implemented in the labs could cause performance degradation. When you receive your computer in the configuration that you ordered, it is already primed for high performance.

The second reason is that an overclocked processor, in general, creates excessive heat and electrical fields that can cause heat fatigue failures within the processor, thus possibly shortening its expected life span. Even slight overclocking can cause a computer to become unstable and lock up.

There are several after-market "performance-modification" products available through various sources, but Dell discourages and does not support the use of those products on its computers.

3

SECTION 3

Solving Problems

Finding Solutions

Finding Help Information

Battery Problems

Drive Problems

E-Mail, Modem, and Internet Problems

Error Messages

General Problems

IEEE 1394 Device Problems

Keyboard Problems

Mouse Problems

Network Problems

Power Problems

Printer Problems

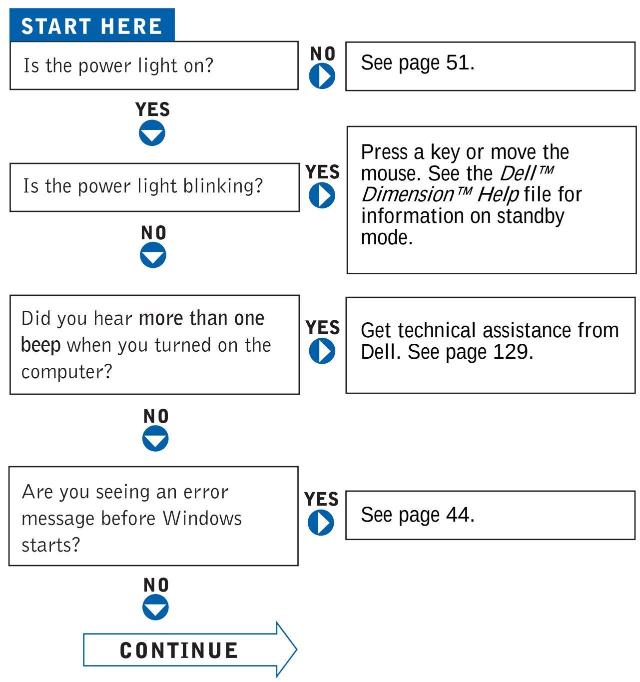
Scanner Problems

Sound and Speaker Problems

Video and Monitor Problems

Finding Solutions

Sometimes it's difficult to figure out where to go for answers. Use this chart to help you quickly find the answers to your questions.



Are you having a problem with...

Are you having a problem with...	YES
video or the monitor?	See page 57.
sound or the speakers?	See page 55.
the modem?	See page 42.
the mouse?	See page 49.
the keyboard?	See page 49.
the hard drive or a disk drive?	See page 39.
the network adapter?	See page 51.
the scanner?	See page 54.
Windows error messages?	See page 44.
a program?	See page 45.
the Internet?	See page 42.
your e-mail?	See page 42.

NO

Are you having some other type of problem?

YES

See page 45

Finding Help Information

TO ACCESS THE DELL™ DIMENSION™ HELP FILE —

1 Click the **Start** button and click **Help and Support**.
2 Click **User and system guides** and click **User's guides**.
3 Click **Dell™ Dimension™ Help**.

TO ACCESS WINDOWS HELP —

1 Click the **Start** button and click **Help and Support**.
2 Type a word or phrase that describes your problem and click the arrow icon.
3 Click the topic that describes your problem.
4 Follow the instructions shown on the screen.

TO LOCATE ADDITIONAL INFORMATION FOR YOUR COMPUTER — See page 9.

Battery Problems

CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

REPLACE THE BATTERY — If you have to repeatedly reset time and date information after turning on the computer, or if an incorrect time or date displays during start-up, replace the battery (see page 115). If the battery still does not work properly, contact Dell (see page 129).

Drive Problems

Floppy drive problems

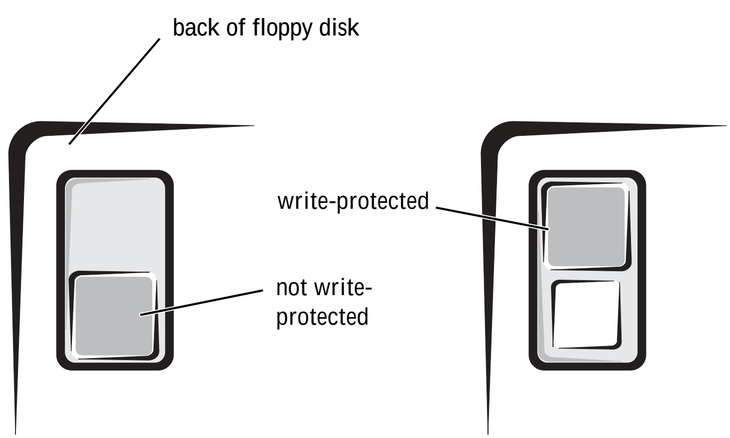
ENSURE THAT WINDOWS® RECOGNIZES THE DRIVE — Click the **Start** button and click **My Computer**. If the floppy drive is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

TEST THE DRIVE —

- Insert another disk to eliminate the possibility that the original floppy disk is defective.
- Insert a bootable floppy disk and reboot the computer.

ENSURE THAT THE DISK IS NOT FULL OR WRITE-PROTECTED —

Ensure that the disk has available space and that it is not write-protected (locked). See the following figure.



NOTICE: Do not attempt to clean drive heads with a swab. You may accidentally misalign the heads, which can render the drive inoperable.

CLEAN THE DRIVE — Use a commercially available cleaning kit.

CD drive problems

NOTE: High-speed CD drive vibration is normal and may cause noise, which does not indicate a defect in the drive or the CD.

ADJUST THE WINDOWS VOLUME CONTROL — Click the speaker icon in the lower-right corner of your screen.

- Ensure that the volume is turned up by clicking the slidebar and dragging it up.
- Ensure that the sound is not muted by clicking any boxes that are checked.

TEST THE DRIVE WITH ANOTHER CD — Insert another CD to eliminate the possibility that the original CD is defective.

CHECK THE SPEAKERS AND SUBWOOFER — See "Sound and Speaker Problems" on page 55.

ENSURE THAT WINDOWS RECOGNIZES THE DRIVE — Click the **Start** button and click **My Computer**. If the CD drive is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

CLEAN THE DISC — See the *Dell™ Dimension™ Help* file for instructions on cleaning your CDs. To access help files, see page 4.

Problems writing to a CD-RW drive

CLOSE OTHER PROGRAMS — The CD-RW drive must receive a steady stream of data when writing. If the stream is interrupted, an error occurs. Try closing all programs before writing to the CD-RW.

TURN OFF STANDBY MODE IN WINDOWS BEFORE WRITING TO A CD-RW DISC — For information on power conservation modes, see the *Dell™ Dimension™ Help* file or search for the keyword *standby* in Windows Help. To access help files, see page 4.

DVD drive problems

NOTE: Because of different regions worldwide and different disc formats, not all DVD titles work in all DVD drives.

TEST THE DRIVE WITH ANOTHER DVD — Insert another DVD to eliminate the possibility that the original DVD is defective.

ENSURE THAT WINDOWS RECOGNIZES THE DRIVE — Click the **Start** button and click **My Computer**. If the DVD drive is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

CLEAN THE DISC — See the *Dell™ Dimension™ Help* file for instructions on cleaning your DVDs. To access help files, see page 4.

CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

Hard drive problems

RUN CHECK DISK —

1 Click the **Start** button and click **My Computer**.

2 Right-click the drive letter (local disk) that you want to scan for errors, and then click **Properties**.

3 Click the **Tools** tab.

4 Under **Error-checking**, click **Check Now**.

5 Click **Start.**

E-Mail, Modem, and Internet Problems

NOTE: Connect the modem to an analog telephone jack only. The modem does not operate while it is connected to a digital telephone network.

NOTE: For optimum performance, install a modem card only in PCI slot 2, 3, or 4.

CHECK THE TELEPHONE LINE CONNECTION — Verify that the telephone line is connected to the jack on the modem. (The jack has either a green label or a connector-shaped icon next to it.) Ensure that you hear a click when you insert the telephone line connector into the modem.

CHECK THE TELEPHONE JACK — Disconnect the telephone line from the modem and connect it to a telephone. Listen for a dial tone.

CONNECT THE MODEM DIRECTLY TO THE TELEPHONE WALL JACK —

If you have other telephone devices sharing the line, such as an answering machine, fax machine, surge protector, or line splitter, then bypass them and use the telephone to connect the modem directly to the telephone wall jack.

USE A DIFFERENT TELEPHONE LINE — If you are using a line that is 3 m (10 ft) or more in length, try a shorter one.

RUN THE MODEM HELPER DIAGNOSTICS — Click the **Start** button, point to **All Programs**, and then click **Modem Helper**. Follow the instructions on the screen to identify and resolve modem problems. (Modem Helper is not available on all computers.)

VERIFY THAT THE MODEM IS COMMUNICATING WITH WINDOWS® —

1. Click the **Start** button and click **Control Panel**.
2. Click **Printers and Other Hardware**.
3. Click **Phone and Modem Options**.
4. Click the **Modems** tab.
5. Click the COM port for your modem.
6. Click **Properties**, click the **Diagnostics** tab, and then click **Query Modem** to verify that the modem is communicating with Windows.

   If all commands receive responses, the modem is operating properly.

TURN OFF CALL WAITING (CATCH-PHONE) — See your telephone directory for instructions on deactivating this feature. Then adjust the dial-up networking connection properties.

1 Click the **Start** button and click **Control Panel.**
2 Click **Printers and Other Hardware**, and then click **Phone and Modem Options.**
3 Click your connection type to highlight it.
4 Click the **Dialing Rules** tab and click **Edit**.
5 Click the **To Disable Call Waiting** box to place a checkmark in it.
6 Select the disable code from the drop-down menu (for example, *70).
7 Click **Apply** and click **OK**.

ENSURE THAT YOU ARE CONNECTED TO THE INTERNET — With the Outlook Express e-mail program open, click **File**. If **Work Offline** has a checkmark next to it, click the checkmark to remove it and connect to the Internet.

ENSURE THAT YOU HAVE SUBSCRIBED TO AN INTERNET SERVICE PROVIDER — Contact an Internet service provider to subscribe.

CONTACT YOUR INTERNET SERVICE PROVIDER — Contact your Internet service provider for assistance.

Error Messages

If the message is not listed, see the documentation for the operating system or the program that was running when the message appeared.

A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? “ < > | — Do not use these characters in filenames.

A REQUIRED .DLL FILE WAS NOT FOUND — The program that you are trying to open is missing an essential file. To remove and then reinstall the program:

1 Click the **Start** button and click **Control Panel**.
2 Click **Add or Remove Programs**.
3 Select the program you want to remove.
4 Click the **Change or Remove Program** icon.
5 See the program documentation for installation instructions.

INSERT BOOTABLE MEDIA — The operating system is trying to boot to a nonbootable floppy disk or CD. Insert a bootable floppy disk or CD.

NON-SYSTEM DISK ERROR — A floppy disk is in the floppy drive. Remove the floppy disk and restart the computer.

NOT ENOUGH MEMORY OR RESOURCES. CLOSE SOME PROGRAMS AND TRY AGAIN — You have too many programs open. Close all windows and open the program that you want to use. In some cases, you might have to restart your computer to restore computer resources. If so, run the program that you want to use first.

OPERATING SYSTEM NOT FOUND — Contact Dell (see page 129).

THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE — The file that you are trying to copy is too large to fit on the disk. Try copying the file to a blank disk or using a larger-capacity disk.

***x*:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY —** The floppy drive cannot read the disk. Insert a floppy disk into the drive and try again.

General Problems

The computer stops responding

TURN THE COMPUTER OFF — If your computer locks up and you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds until the computer turns off. Then press the power button again to turn on the computer. You might lose data if you are unable to perform an operating system shutdown.

A program stops responding

END THE PROGRAM —

1 Press <Ctrl><Shift><Esc> simultaneously.

2 Click **Applications**.

3 Click the program that is no longer responding.

4 Click **End Task**.

A program crashes repeatedly

NOTE: Software usually includes installation instructions in its documentation or on a floppy disk or CD.

CHECK THE SOFTWARE DOCUMENTATION — Many software manufacturers maintain websites with information that may help you solve the problem. Ensure that you properly installed and configured the program. If necessary, uninstall and then reinstall the program.

A program is designed for an earlier Windows operating system

RUN THE PROGRAM COMPATIBILITY WIZARD —

Windows XP provides a Program Compatibility Wizard that configures a program so it runs in an environment similar to non-Windows XP operating system environments.

1 Click the **Start** button, point to **All Programs**→ **Accessories**, and then click **Program Compatibility Wizard**.
2 In the welcome screen, click **Next**.
3 Follow the instructions on the screen.

A solid blue screen appears

TURN THE COMPUTER OFF — If the computer does not respond to a keystroke or a proper shutdown, press the power button for at least 8 to 10 seconds until the computer turns off. Press the power button again to restart the computer. The chkdsk program automatically runs during the start-up process. Follow the instructions on the screen.

Other software problems

CHECK THE SOFTWARE DOCUMENTATION OR CONTACT THE SOFTWARE MANUFACTURER FOR TROUBLESHOOTING INFORMATION

BACK UP YOUR FILES IMMEDIATELY — If your computer has a CD-RW drive installed, see the drive's documentation for instructions.

ENSURE THAT YOU HAVE NOT MADE AN ERROR WHILE ENTERING DATA — See the program documentation to ensure that the values or characters you are entering are valid.

CHECK FOR VIRUSES — Use a virus-scanning program to check the hard drive, floppy disks, or CDs.

RESTART THE COMPUTER — Save and close any open files, exit any open programs, and then shut down your computer through the **Start** menu instead of by pressing the power button. Otherwise, you may lose data.

CHECK FOR COMPATIBILITY —

- Ensure that the program is compatible with the operating system installed on your computer and that your computer meets the minimum hardware requirements needed to run the software. See the software documentation for information.
- If necessary, uninstall and then reinstall the program.

ENSURE THAT YOU PROPERLY INSTALLED AND CONFIGURED THE PROGRAM — See the software documentation for information. If necessary, uninstall and then reinstall the program.

Other technical problems

GO TO THE DELL SUPPORT WEBSITE — Go to **support.dell.com** for help with general usage, installation, and troubleshooting questions.The support website offers several different tools to help you, such as Dell Forum—a chat room where you can communicate with other Dell customers about their computers and gain access to technical support through e-mail. See "Dell Support Website" on page 10 for more information about the website. See "Dell Technical Support Policy (U.S. Only)" on page 128 for a description of the hardware and software support provided by Dell.

CALL DELL — If you cannot solve your problem using the Dell Support website or e-mail service, call Dell for technical assistance (see page 129). See "Dell Technical Support Policy (U.S. Only)" on page 128 for a description of the hardware and software support provided by Dell.

General hardware problems

If your computer exhibits one or more of the following symptoms, a device conflict may exist:

- Your computer locks up, particularly while using a specific device.
- A recently added device does not work.
- A sound card emits noise or demonstrates other problems.
- Unintelligible characters print from the printer.
- The mouse pointer does not move or "stutters" when it moves.

- Messages appear stating that the computer is not operating at maximum performance.
- Errors occur and programs crash for no apparent reason.
- Nothing displays on the monitor.

REMOVE ANY RECENTLY ADDED HARDWARE TO SEE IF IT RESOLVES THE CONFLICT — If removing the hardware resolves the conflict, see the hardware documentation for configuration and troubleshooting instructions. If the problem persists, contact the hardware manufacturer for technical assistance.

CHECK YOUR OPERATING SYSTEM DOCUMENTATION FOR ADDITIONAL TROUBLESHOOTING INFORMATION

CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

IEEE 1394 Device Problems

NOTE: Check Windows Explorer to see if your device is listed as a drive.

CHECK THE IEEE 1394 DEVICE — Ensure that the IEEE 1394 device is properly inserted into the connector.

ENSURE THAT THE IEEE 1394 DEVICE IS RECOGNIZED BY WINDOWS® —

1 Click the **Start** button and click **Control Panel**.

2 Click **Printers and Other Hardware**.

If your IEEE 1394 device is listed, Windows recognizes the device.

IF YOU HAVE PROBLEMS WITH A DELL-PROVIDED IEEE 1394 DEVICE — Contact Dell (see page 129).

IF YOU HAVE PROBLEMS WITH AN IEEE 1394 DEVICE NOT PROVIDED BY DELL — Contact the IEEE 1394 device manufacturer.

Keyboard Problems

RESTART THE COMPUTER —

- If the mouse is functioning, shut down the computer through the **Start** menu (see page 30). After the computer shuts down, press the power button to restart the computer.
- If the computer does not respond to a keystroke or the mouse, press the power button for at least 8 to 10 seconds until the computer turns off. Press the power button again to restart the computer.

CHECK THE KEYBOARD CABLE —

- Ensure that the keyboard cable is firmly connected to the computer.
- Shut down the computer (see page 30), reconnect the keyboard cable as shown on the setup diagram for your computer, and then restart the computer.
- Check the cable connector for bent or broken pins and for damaged or frayed cables. Straighten bent pins.
- Remove keyboard extension cables and connect the keyboard directly to the computer.

TEST THE KEYBOARD — Connect a properly working keyboard to the computer, and try using the keyboard. If the new keyboard works, the original keyboard is faulty.

CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

Mouse Problems

RESTART THE COMPUTER —

1. Simultaneously press <Ctrl><Esc> to display the **Start** menu.
2. Type u, press the keyboard arrow keys to highlight **Shut down** or **Turn Off**, and then press <Enter>.
3. After the computer turns off, press the power button to restart the computer.

IF YOU CONNECTED THE MOUSE BEFORE TURNING ON THE COMPUTER, RECONNECT THE MOUSE CABLE —

1 Simultaneously press <Ctrl><Esc> to display the **Start** menu.
2 Type u, press the keyboard arrow keys to highlight **Shut down** or **Turn Off**, and then press <Enter>.
3 After the computer turns off, reconnect the mouse cable as shown on the setup diagram for your computer.
4 Start the computer.

IF YOU CONNECTED THE MOUSE AFTER TURNING ON THE COMPUTER, REMOVE THE POWER CABLE, AND THEN RECONNECT THE MOUSE CABLE — If the mouse is connected after the power is turned on, the mouse appears to be nonfunctional. To make the mouse function properly:

1 While your computer is on, remove the power cable from the back of the computer.
2 Connect the mouse to the computer.
3 Reconnect the power cable.
4 Turn on your computer.

Pressing the power button does not clear the computer's settings and does not restore mouse functionality.

CHECK THE MOUSE CABLE —

- Check the cable connector for bent or broken pins and for damaged or frayed cables. Straighten bent pins.
- Ensure that the cable is firmly connected to the computer.

TEST THE MOUSE — Connect a properly working mouse to the computer, and try using the mouse. If the new mouse works, the original mouse was faulty.

CHECK THE MOUSE SETTINGS —

1 Click the **Start** button, click **Control Panel**, and then click **Printers and Other Hardware**.
2 Click **Mouse**.
3 Try adjusting the settings.

REINSTALL THE MOUSE DRIVER — See page 67.

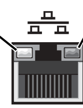
CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

Network Problems

CHECK THE NETWORK CABLE CONNECTOR — Ensure that the network cable is connected as shown on the setup diagram (see page 10).

CHECK THE NETWORK LIGHTS ON THE BACK OF THE COMPUTER —

No light indicates that no network communication exists. Replace the network cable.



RESTART THE COMPUTER AND TRY TO LOG ON TO THE NETWORK AGAIN

CHECK YOUR NETWORK SETTINGS — Contact your network administrator or the person who set up your network to verify that your network settings are correct and that the network is functioning.

CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

Power Problems

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

ADJUST THE POWER PROPERTIES — Your computer may be in standby or hibernate mode. For information on power conservation modes, see the *Dell*™ *Dimension*™ *Help* file, or search for the keyword *standby* or *hibernate* in Windows® Help. To access help files, see page 4.

IF THE POWER LIGHT IS BLINKING GREEN — The computer is in standby mode. Press a key on the keyboard or move the mouse to resume normal operation.

IF THE POWER LIGHT IS OFF — The computer is either turned off or is not receiving power.

- Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
- If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on.
- Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
- Bypass power protection devices, power strips, and power extension cables to verify that the computer turns on.
- Ensure that the main power cable is securely connected to the system board (see page 85).
- Ensure that the front panel cable is securely connected to the system board (see page 85).
- If the problem persists, contact Dell (see page 129).

IF THE POWER LIGHT IS AMBER AND GREEN — The computer is receiving electrical power, but an internal power problem might exist.

- Ensure that the microprocessor power cable is securely connected to the system board (see page 85).
- If the problem persists, contact Dell (see page 129).

IF THE POWER LIGHT IS STEADY AMBER — The computer is receiving electrical power, but an internal power problem might exist.

- Ensure that the microprocessor power cable is securely connected to the system board (see page 85).
- If the problem persists, contact Dell (see page 129).

IF THE POWER LIGHT IS BLINKING AMBER — A device might be malfunctioning or incorrectly installed.

- Remove and then reinstall the memory modules (see page 86).
- Remove and then reinstall any cards (see page 89).
- Remove and then reinstall the video card, if applicable (see page 89).
- If the problem persists, contact Dell (see page 129).

ELIMINATE INTERFERENCE — Electrical appliances on the same circuit or operating near the computer can cause interference. Other causes of interference are:

- Power extension cables
- Keyboard and mouse extension cables
- Too many devices on a power strip
- Multiple power strips connected to the same electrical outlet

Printer Problems

NOTE: Dell does not cover the printer's warranty. If you need technical assistance for your printer, call the printer's manufacturer. See the printer documentation for the correct phone number.

CHECK THE PRINTER DOCUMENTATION — See the printer documentation for setup and troubleshooting information.

ENSURE THAT THE PRINTER IS TURNED ON — See the printer documentation for power button information.

VERIFY THE PRINTER CABLE CONNECTIONS —

- See the printer documentation for cable connection information.
- Ensure that the printer cables are securely connected to the printer and the computer.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

VERIFY THAT THE PRINTER IS RECOGNIZED BY WINDOWS® — **1** Click the **Start** button.

2 Click **Control Panel**.

3 Click **Printers and Other Hardware**.

4 Click **View installed printers or fax printers**.

If the printer is listed, right-click the printer icon.

5 Click **Properties,** and then select the **Ports** tab. For a parallel printer, ensure that the **Print to the following port(s):** setting is **LPT1 (Printer Port)**. For a USB printer, ensure that the **Print to the following port(s):** setting is **USB**.

REINSTALL THE PRINTER DRIVER — See the printer documentation for instructions.

Scanner Problems

NOTE: Dell does not cover the scanner's warranty. If you need technical assistance for your scanner, call the scanner's manufacturer. See the scanner documentation for the correct phone number.

CHECK THE SCANNER DOCUMENTATION — See the scanner documentation for setup and troubleshooting information.

UNLOCK THE SCANNER — Ensure that your scanner is unlocked if it has a locking tab or button.

RESTART THE COMPUTER AND TRY THE SCANNER AGAIN

CHECK THE CABLE CONNECTIONS —

- If your scanner has a power cable, ensure that the power cable is firmly connected to a working electrical outlet and that the scanner is turned on.
- Ensure that the scanner cable is firmly connected to the computer and to the scanner.

VERIFY THAT THE SCANNER IS RECOGNIZED BY MICROSOFT® WINDOWS® —

1 Click the **Start** button and click **Control Panel**.

2 Click **Printers and Other Hardware**.

3 Click **Scanners and Cameras**.

If your scanner is listed, Windows recognizes the scanner.

REINSTALL THE SCANNER DRIVER — See the scanner documentation for instructions.

Sound and Speaker Problems

NOTE: For optimum performance, install a PCI sound card only in PCI slot 3 or 4.

No sound from speakers

NOTE: The volume control in some MP3 players overrides the Windows® volume setting. If you have been listening to MP3 songs, ensure that you did not turn the player volume down or off.

CHECK THE SPEAKER CABLE CONNECTIONS — Ensure that the speakers are connected as shown on the setup diagram supplied with the speakers. If you purchased a sound card, ensure that the speakers are connected to the card.

ENSURE THAT THE SUBWOOFER AND THE SPEAKERS ARE TURNED ON — See the setup diagram supplied with the speakers. If your speakers have volume controls, adjust the volume, bass, or treble to eliminate distortion.

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

DISCONNECT HEADPHONES FROM THE HEADPHONE CONNECTOR —

Sound from the speakers is automatically disabled when headphones are connected to the computer's front-panel headphone connector.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

ENABLE DIGITAL MODE — Your speakers do not work if the CD drive is operating in analog mode. To enable digital mode:

1 Click the **Start** button, click **Control Panel**, and then click **Sounds, Speech, and Audio Devices**.
2 Click **Sounds and Audio Devices**.
3 Click the **Hardware** tab.
4 Double-click the name of your CD drive.
5 Click the **Properties** tab.
6 Check the **Enable digital CD audio for this CD-ROM device** box.

ELIMINATE POSSIBLE INTERFERENCE — Turn off nearby fans, fluorescent lights, or halogen lamps to check for interference.

RUN THE SPEAKER DIAGNOSTICS — Some speaker systems have self-diagnostics. See the speaker documentation for diagnostics instructions.

REINSTALL THE AUDIO (SOUND) DRIVER — See page 67.

CHECK FOR INTERRUPT REQUEST CONFLICTS — See page 71.

No sound from headphones

CHECK THE HEADPHONE CABLE CONNECTION — Ensure that the headphone cable is securely inserted into the headphone connector (see page 76).

DISABLE DIGITAL MODE — Your headphones do not work if the CD drive is operating in digital mode. To disable digital mode:

1 Click the **Start** button, click **Control Panel**, and then click **Sounds, Speech, and Audio Devices**.
2 Click **Sounds and Audio Devices**.
3 Click the **Hardware** tab.
4 Double-click the name of your CD drive.
5 Click the **Properties** tab.
6 Uncheck the **Enable digital CD audio for this CD-ROM device** box.

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

Video and Monitor Problems

If the screen is blank

NOTE: See the monitor documentation for troubleshooting procedures.

CHECK THE MONITOR POWER LIGHT — If the power light is off, firmly press the button to ensure that the monitor is turned on. If the power light is lit or blinking, the monitor has power. If the power light is blinking, press a key on the keyboard or move the mouse.

CHECK THE MONITOR CABLE CONNECTION — Check the connector for bent or broken pins. (It is normal for monitor cable connectors to have missing pins.) Ensure that the video cable is connected as shown on the setup diagram for your computer.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

SWAP THE POWER CABLES — Swap the computer and monitor power cables to determine if the power cable is defective.

TEST THE VIDEO EXTENSION CABLE (IF USED) — If you are using a video extension cable and removing the cable solves the problem, the cable is defective.

TEST ANOTHER MONITOR — If another monitor is available, connect it to the computer.

CHECK THE DIAGNOSTIC LIGHTS — See page 60.

If the screen is difficult to read

CHECK THE MONITOR SETTINGS — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

MOVE THE SUBWOOFER AWAY FROM THE MONITOR — If your speaker system includes a subwoofer, ensure that the subwoofer is at least 60 cm (2 ft) away from the monitor.

MOVE THE MONITOR AWAY FROM EXTERNAL POWER SOURCES —

Fans, fluorescent lights, halogen lamps, and other electrical devices can cause the screen image to appear "shaky." Turn off nearby devices to check for interference.

ROTATE THE MONITOR TO FACE A DIFFERENT DIRECTION — Eliminate sunlight glare, which can cause poor picture quality.

ADJUST THE WINDOWS® DISPLAY SETTINGS —

1. Click the **Start** button and click **Control Panel**.
2. Click **Appearance and Themes**.
3. Click **Display** and click the **Settings** tab.
4. Try different settings for **Screen resolution** and **Color quality.**

4

SECTION 4

Advanced Troubleshooting

Diagnostic Lights

Dell Diagnostics

Drivers

Using Windows® XP System Restore

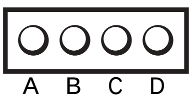
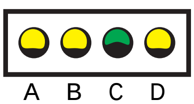
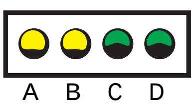
Resolving Software and Hardware Incompatibilities

Reinstalling Microsoft® Windows® XP

Diagnostic Lights

To help you troubleshoot a problem, your computer has four lights labeled "A," "B," "C," and "D" (see page 78) on the back panel. The lights can be yellow or green. When the computer starts normally, the lights flash. After the computer starts, all four lights display solid green. If the computer malfunctions, the color and sequence of the lights identify the problem.

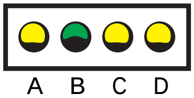
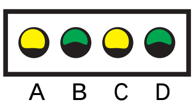
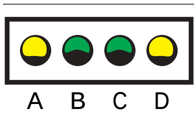
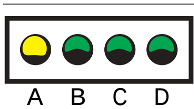
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

Light Pattern	Problem Description	Suggested Resolution
	The computer is in a normal off condition or a possible pre-BIOS failure has occurred.	Verify that the computer is plugged into a working electrical outlet and that you have pressed the power button.
	A possible microprocessor failure has occurred.	Reinstall the microprocessor (see page 107) and restart the computer.
	Memory modules are detected, but a memory failure has occurred.	**1** Reinstall all memory modules (see page 86). **2** Ensure that all the connector tabs are locked. **3** Restart the computer. **4** If the problem persists, contact Dell (see page 129).

 = yellow

 = green

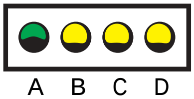
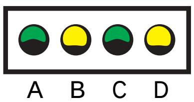
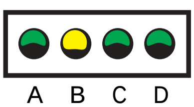
 = off

Light Pattern	Problem Description	Suggested Resolution
	A possible expansion card failure has occurred.	**1** Determine if a conflict exists by removing a card (not a video card) (see page 89) and then restarting the computer. **2** If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. **3** Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Incompatibilities" on page 71). **4** If the problem persists, contact Dell (see page 129).
	A possible video card failure has occurred.	• If the computer has a video card, remove the card, reinstall it (see page 89), and then restart the computer. • If the problem still exists, install a video card that you know works and restart the computer. • If the problem persists or the computer has integrated video, contact Dell (see page 129).
	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.

 = yellow

 = green

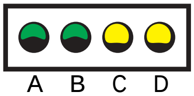
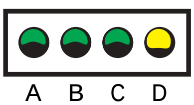
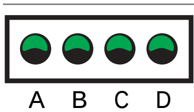
 = off

Light Pattern	Problem Description	Suggested Resolution
	No memory modules are detected.	**1** Reinstall all memory modules (see page 86). **2** Ensure that all the connector tabs are locked. **3** Restart the computer. **4** If the problem persists, contact Dell (see page 129).
	Memory modules are detected, but a memory configuration or compatibility error exists.	• Ensure that no special memory module/memory connector placement requirements exist (see page 86). • Verify that the memory modules that you are installing are compatible with your computer (see page 86). • If the problem persists, contact Dell (see page 129).
	A possible system board resource and/or hardware failure has occurred.	See "Resolving Software and Hardware Incompatibilities" on page 71. If the problem persists, contact Dell (see page 129).

 = yellow

 = green

 = off

Light Pattern	Problem Description	Suggested Resolution
	A possible expansion card failure has occurred.	**1** Determine if a conflict exists by removing a card (not a video card) (see page 89) and restarting the computer. **2** If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. **3** Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Incompatibilities" on page 71). **4** If the problem persists, contact Dell (see page 129).
	Another failure has occurred.	• Ensure that the cables are properly connected to the system board (see page 85) from the hard drive, CD drive, and DVD drive. • If the problem persists, contact Dell (see page 129).
	The computer is in a normal operating condition after POST.	None.

	= yellow
	= green
	= off

Dell Diagnostics

When to Use the Dell Diagnostics

If you experience a problem with your computer, perform the checks in "Solving Problems" (see page 35) and run the Dell Diagnostics before you contact Dell for technical assistance. Running the Dell Diagnostics may help you resolve the problem without contacting Dell. If you do contact Dell, the test results can provide important information for Dell's service and support personnel.

The Dell Diagnostics allows you to:

- Perform tests on one or all devices.
- Select tests based on a symptom of the problem you are having.
- Choose how many times a test is run.
- Suspend testing if an error is detected.
- Access help information that describes the tests and devices.
- Receive status messages that tell you whether tests completed successfully.
- Receive error messages if problems are detected.

Starting the Dell Diagnostics

NOTICE: Use the Dell Diagnostics to test your Dell™ computer only. Using this program with other computers can result in error messages.

Start the Dell Diagnostics from either your hard drive (see page 64) or from the *Dell Dimension ResourceCD* (see page 65).

Starting the Dell Diagnostics From Your Hard Drive

1. Shut down (see page 30) and restart the computer.
2. When the DELL™ logo appears, press <F12> immediately.

NOTE: If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from your ResourceCD (see page 65).

If you wait too long and the Microsoft® Windows® logo appears, continue to wait until you see the Windows desktop. Then shut down your computer through the **Start** menu and try again.

3 When the boot device list appears, highlight **Boot to Utility Partition** and press <Enter>.

4 When the Dell Diagnostics **Main Menu** appears, select the test you want to run (see page 66).

Starting the Dell Diagnostics From the ResourceCD

1 Insert the ResourceCD.

2 Shut down (see page 30) and restart the computer.

When the DELL logo appears, press <F12> immediately.

If you wait too long and the Windows logo appears, continue to wait until you see the Windows desktop. Then shut down your computer through the **Start** menu and try again.

NOTE: This feature changes the boot sequence for one time only. On the next start-up, the computer boots according to the devices specified in the system setup program.

3 When the boot device list appears, highlight **IDE CD-ROM Device** and press <Enter>.

4 Select the **IDE CD-ROM Device** option from the CD boot menu.

5 Select the **Boot from CD-ROM** option from the menu that appears.

6 Type `1` to start the ResourceCD menu.

7 Type `2` to start the Dell Diagnostics.

8 Select **Run the 32 Bit Dell Diagnostics** from the numbered list. If multiple versions are listed, select the version appropriate for your computer.

9 When the Dell Diagnostics **Main Menu** appears, select the test you want to run (see page 66).

Dell Diagnostics Main Menu

1 After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

Option	Function
Express Test	Performs a quick test of devices. This test typically takes 10 to 20 minutes and requires no interaction on your part. Run **Express Test** first to increase the possibility of tracing the problem quickly.
Extended Test	Performs a thorough check of devices. This test typically takes an hour or more and requires you to answer questions periodically.
Custom Test	Tests a specific device. You can customize the tests you want to run.
Symptom Tree	Lists the most common symptoms encountered and allows you to select a test based on the symptom of the problem you are having.

2 If a problem is encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description and follow the instructions on the screen.

If you cannot resolve the error condition, contact Dell (see page 129).

NOTE: The Service Tag for your computer is located at the top of each test screen. If you contact Dell, technical support will ask for your Service Tag number.

3 If you run a test from the **Custom Test** or **Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.

Tab	Function *(continued)*
Configuration	Displays your hardware configuration for the selected device. The Dell Diagnostics obtains configuration information for all devices from the system setup program, memory, and various internal tests, and it displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

4 When the tests are completed, if you are running the Dell Diagnostics from the ResourceCD, remove the CD.

5 Close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

Drivers

What Is a Driver?

A driver is a program that controls a device such as a printer, mouse, or keyboard. All devices require a driver program.

A driver acts like a translator between the device and any other programs that use the device. Each device has its own set of specialized commands that only its driver recognizes.

Dell ships your computer to you with required drivers already installed—no further installation or configuration is needed.

NOTICE: The *Dell Dimension ResourceCD* may contain drivers for operating systems that are not on your computer. Ensure that you are installing software appropriate for your operating system.

Many drivers, such as the keyboard driver, come with your Microsoft® Windows® operating system. You may need to install drivers if you:

- Upgrade your operating system.
- Reinstall your operating system.
- Connect or install a new device.

Identifying Drivers

If you experience a problem with any device, identify whether the driver is the source of your problem and, if necessary, update the driver.

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a Category**, click **Performance and Maintenance**.

3 Click **System**.

4 In the **System Properties** window, click the **Hardware** tab.

5 Click **Device Manager**.

6 Scroll down the list to see if any device has an exclamation point (a yellow circle with a [**!**]) on the device icon.

   If an exclamation point is next to the device name, you may need to reinstall the driver or install a new driver (see page 68).

Reinstalling Drivers

NOTICE: The Dell Support website at support.dell.com and your *Dell Dimension ResourceCD* provide approved drivers for Dell™ computers. If you install drivers obtained from other sources, your computer might not work correctly.

Using Windows XP Device Driver Rollback

If a problem occurs on your computer after you install or update a driver, use Windows XP Device Driver Rollback to replace the driver with the previously installed version.

1 Click the **Start** button and click **Control Panel**.

2 Under **Pick a Category**, click **Performance and Maintenance**.

3 Click **System**.

4 In the **System Properties** window, click the **Hardware** tab.

5 Click **Device Manager**.

6 Right-click the device for which the new driver was installed and click **Properties**.

7 Click the **Drivers** tab.

8 Click **Roll Back Driver**.

If Device Driver Rollback does not resolve the problem, then use System Restore (see page 69) to return your computer to the operating state that existed before you installed the new driver.

Using the ResourceCD

If using Device Driver Rollback or System Restore (see page 69) does not resolve the problem, then reinstall the driver from the ResourceCD.

1. With the Windows desktop displayed, insert the ResourceCD.

   If this is your first time to use the ResourceCD, go to step 2. If not, go to step 5.

2. When the ResourceCD installation program starts, follow the prompts on the screen.

3. When the **InstallShield Wizard Complete** window appears, remove the ResourceCD and click **Finish** to restart the computer.

4. When you see the Windows desktop, reinsert the ResourceCD.

5. At the **Welcome Dell System Owner** screen, click **Next**.

   NOTE: The ResourceCD displays drivers only for hardware that came installed in your computer. If you installed additional hardware, the drivers for the new hardware might not be displayed by the ResourceCD. If those drivers are not displayed, exit the ResourceCD program. For drivers information, see the documentation that came with the device.

   A message stating that the ResourceCD is detecting hardware in your computer appears.

   The drivers that are used by your computer are automatically displayed in the **My Drivers—The ResourceCD has identified these components in your system** window.

6. Click the driver that you want to reinstall and follow the instructions on the screen.

If a particular driver is not listed, then that driver is not required by your operating system.

Using Windows® XP System Restore

The Microsoft® Windows XP operating system provides System Restore to allow you to return your computer to an earlier operating state (without affecting data files) if changes to the hardware, software, or other system settings have left the computer in an undesirable operating state. See the Windows Help and Support Center for information on using System Restore. To access help, see page 38.

NOTICE: Make regular backups of your data files. System Restore does not monitor your data files or recover them.

Creating a Restore Point

1. Click the **Start** button and click **Help and Support**.
2. Click **System Restore**.
3. Follow the instructions on the screen.

Restoring the Computer to an Earlier Operating State

If problems occur after you install a device driver, use Device Driver Rollback (see page 68) to resolve the problem. If that is unsuccessful, then use System Restore.

NOTICE: Before you restore the computer to an earlier operating state, save and close any open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1. Click the **Start** button, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.
2. Ensure that **Restore my computer to an earlier time** is selected and click **Next**.
3. Click a calendar date to which you want to restore your computer.

   The **Select a Restore Point** screen provides a calendar that allows you to see and select restore points. All calendar dates with available restore points appear in boldface type.
4. Select a restore point and click **Next**.

   If a calendar date has only one restore point, then that restore point is automatically selected. If two or more restore points are available, click the restore point that you prefer.
5. Click **Next**.

   The **Restoration Complete** screen appears after System Restore finishes collecting data and then the computer restarts.
6. After the computer restarts, click **OK**.

To change the restore point, you can either repeat the steps using a different restore point, or you can undo the restoration.

Undoing the Last System Restore

NOTICE: Before you undo the last system restore, save and close all open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1. Click the **Start** button, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.
2. Click **Undo my last restoration** and click **Next**.
3. Click **Next**.

   The **System Restore** screen appears and the computer restarts.
4. After the computer restarts, click **OK**.

Enabling System Restore

If you reinstall Windows XP with less than 200 MB of free hard-disk space available, System Restore is automatically disabled. To see if System Restore is enabled:

1 Click the **Start** button and click **Control Panel**.

2 Click **Performance and Maintenance**.

3 Click **System**.

4 Click the **System Restore** tab.

5 Ensure that **Turn off System Restore** is unchecked.

Resolving Software and Hardware Incompatibilities

Windows XP IRQ conflicts occur if a device either is not detected during the operating system setup or is detected but incorrectly configured.

To check for conflicts on a computer running Windows XP:

1 Click the **Start** button and click **Control Panel**.

2 Click **Performance and Maintenance** and click **System**.

3 Click the **Hardware** tab and click **Device Manager**.

4 In the **Device Manager** list, check for conflicts with the other devices.

   Conflicts are indicated by a yellow exclamation point (`!`) beside the conflicting device or a red `X` if the device has been disabled.

5 Double-click any conflict to display the **Properties** window.

   If an IRQ conflict exists, the **Device** status area in the **Properties** window reports the cards or devices that share the device's IRQ.

6 Resolve conflicts by reconfiguring the devices or removing the devices from the **Device Manager**.

To use the Windows XP Hardware Troubleshooter:

1 Click the **Start** button and click **Help and Support**.

2 Type `hardware troubleshooter` in the **Search** field and click the arrow to start the search.

3 Click **Hardware Troubleshooter** in the **Search Results** list.

4 In the **Hardware Troubleshooter** list, click **I need to resolve a hardware conflict on my computer**, and click **Next**.

Reinstalling Microsoft® Windows® XP

Before You Reinstall

If you are considering reinstalling the Windows XP operating system to correct a problem with a newly installed driver, first try using Windows XP Device Driver Rollback (see page 68). If Device Driver Rollback does not resolve the problem, then use System Restore (see page 69) to return your operating system to the operating state it was in before you installed the new device driver.

Reinstalling Windows XP

To reinstall Windows XP, perform all the steps in the following sections in the order in which they are listed.

The reinstallation process can take 1 to 2 hours to complete. After you reinstall the operating system, you must also reinstall the device drivers, virus protection program, and other software.

NOTICE: The *Operating System* CD provides options for reinstalling Windows XP. The options can overwrite files and possibly affect programs installed on your hard drive. Therefore, do not reinstall Windows XP unless instructed to do so by a Dell technical support representative.

NOTICE: To prevent conflicts with Windows XP, disable any virus protection software installed on your computer before you reinstall Windows XP. See the documentation that came with the software for instructions.

Booting From the Operating System CD

1 Save and close any open files and exit any open programs.

2 Insert the *Operating System* CD. If any program starts automatically, exit the program before proceeding.

3 Shut down the computer through the **Start** menu (see page 30) and restart the computer.

4 Press <F12> immediately after the DELL™ logo appears.

If the operating system logo appears, wait until you see the Windows desktop, and then shut down the computer and try again.

5 Press the arrow keys to select **CD-ROM**, and then press <Enter>.

6 When the `Press any key to boot from CD` message appears, press any key.

Windows XP Setup

1 When the **Windows XP Setup** screen appears, press <Enter> to select **To set up Windows now**.

2 Read the information on the **Microsoft Windows Licensing Agreement** screen, and press <F8> to accept the license agreement.

3 If your computer already has Windows XP installed and you want to recover your current Windows XP data, type `r` to select the repair option, and then remove the CD from the drive.

4 If you want to install a new copy of Windows XP, press <Esc> to select that option.

5 Press <Enter> to select the highlighted partition

(recommended), and then follow the instructions on the screen.

NOTE: The time required to complete the setup depends on the size of the hard drive and the speed of your computer.

The **Windows XP Setup** screen appears, and the operating system begins to copy files and install the devices. The computer automatically restarts multiple times.

NOTICE: Do not press any key when the following message appears: `Press any key to boot from the CD`.

6 When the **Regional and Language Options** screen appears, select the settings for your location, and then click **Next**.

7 Enter your name and organization (optional) in the **Personalize Your Software** screen and click **Next**.

8 *If you are reinstalling Windows XP Home Edition*, at the **What's your computer's name** window, enter a name for your computer (or accept the name provided) and click **Next**.

If you are reinstalling Windows XP Professional, at the **Computer Name and Administrator Password** window, enter a name for your computer (or accept the one provided) and a password, and then click **Next**.

9 If the **Modem Dialing Information** screen appears, enter the requested information and click **Next**.

10 Enter the date, time, and time zone in the **Date and Time Settings** window and click **Next**.

11 If the **Networking Settings** screen appears, click **Typical** and click **Next**.

12 If you are reinstalling Windows XP Professional and you are prompted to provide further information regarding your network configuration, enter your selections. If you are unsure of your settings, accept the default selections.

Windows XP installs the operating system components and configures the computer. The computer automatically restarts.

NOTICE: Do not press any key when the following message appears: `Press any key to boot from the CD`.

13 When the **Welcome to Microsoft** screen appears, click **Next**.

14 When the `How will this computer connect to the Internet?` message appears, click **Skip**.

15 When the **Ready to register with Microsoft?** screen appears, select **No, not at this time** and click **Next**.

16 When the **Who will use this computer?** screen appears, you can enter up to five users. Click **Next**.

17 Click **Finish** to complete the setup, and remove the CD from the drive.

Reinstalling Drivers and Software

1 Reinstall the appropriate drivers (see page 67).

2 Reinstall your virus protection software. See the documentation that came with the software for instructions.

3 Reinstall your other software programs. See the documentation that came with the software for instructions.

5

SECTION 5

Removing and Installing Parts

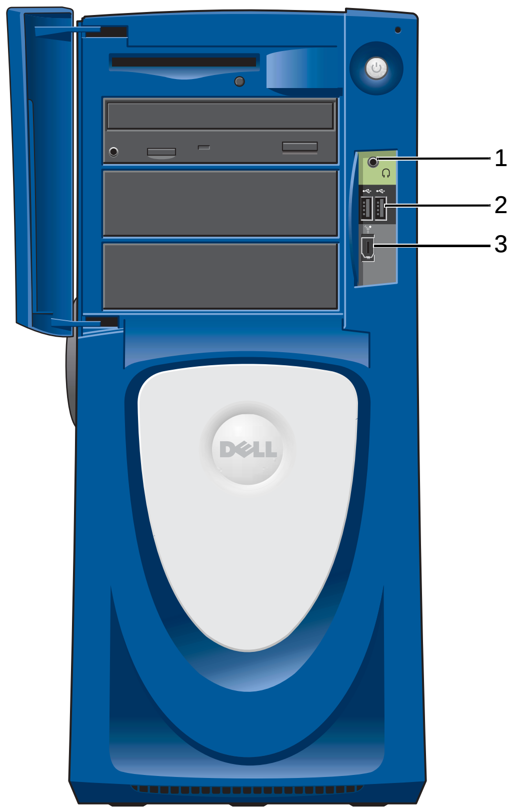
Front and Back View of the Computer

Front View



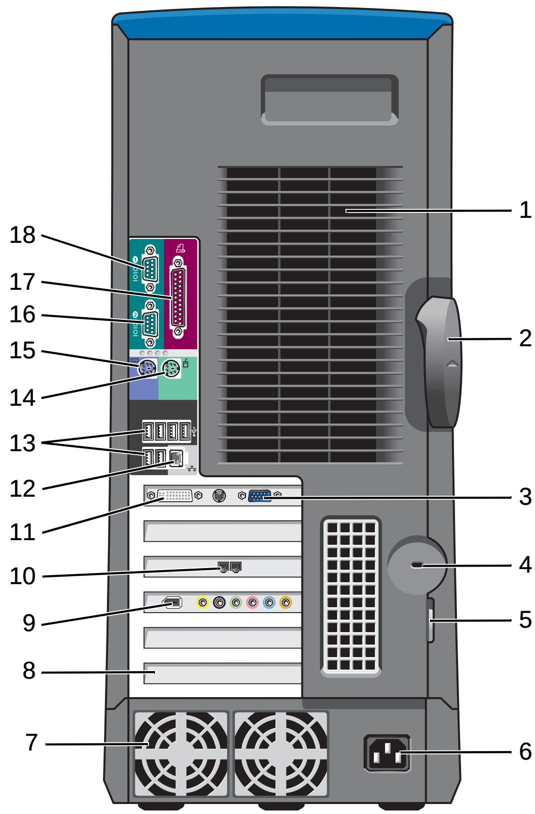
1	hard-drive activity light	The hard-drive light is on when the computer reads data from or writes data to the hard drive. The light might also be on when a device such as your CD player is operating.
2	power button	Press this button to turn on the computer. **NOTICE:** To avoid losing data, do not use the power button to turn off the computer. Instead, perform a Microsoft® Windows® shutdown.
3	drive door	Open the drive door to access the floppy and CD/DVD drives.
4	front panel door	Open the door to use the front panel connectors.

Front View (Doors Open)

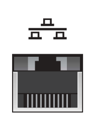


1	headphone connector	Use the headphone connector to attach headphones and most kinds of speakers for listening to all sounds in your computer, including your CD player and system sounds such as beeps.
2	USB 2.0 connectors (2)	Use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras. It is recommended that you use the back USB connectors for devices that typically remain connected, such as printers and keyboards.
3	IEEE 1394 connector	Attach high-speed serial multimedia devices, such as a digital video camera.

Back View



1	microprocessor fans (2)	For optimal cooling, two microprocessor fans are provided. Do not block the vents.
2	cover release latch	To open the computer, lay the computer on its side with the cover release latch at the top and then push the latch to the left. See "Opening the Computer Cover" on page 82.
3	VGA video connector	If your monitor has a DVI connector, plug it into the DVI connector on the computer. If your monitor has a VGA connector, plug it into the VGA connector on the computer.
4	security cable slot	Use a security cable with the slot to help secure your computer.
5	padlock ring	Insert a padlock to lock the computer cover.
6	power connector	Insert the power cable.
7	power supply fans	For optimal cooling, two power supply fans are provided. Do not block the vents.

8	card slots	Access connectors for any installed PCI (4 slots) and AGP cards (1 slot).
9	PCI sound card with IEEE 1394	• Line-in connector — Use the blue line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. • Microphone connector — Use the pink microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. • Line-out connector — Use the green line-out connector to attach headphones and most speakers with integrated amplifiers. • Surround connector — Use the black surround connector to attach multichannel-capable speakers. • Center/LFE connector — Use the yellow center/Low-Frequency Effects (LFE) connector to attach your subwoofer. • IEEE 1394 connector — Attach high-speed serial multimedia devices, such as a digital video camera. **NOTE:** For optimum performance, install a PCI sound card only in PCI slot 3 or 4.
10	modem connector	If you have a modem, connect a telephone cable to the modem connector (optional). **NOTE:** For optimum performance, install a modem card only in PCI slot 2, 3, or 4.
11	DVI video connector	If your monitor has a DVI connector, plug it into the DVI connector on the computer. If your monitor has a VGA connector, plug it into the VGA connector on the computer.
12	network adapter connector	To attach your computer to a network or broadband device, connect one end of a network cable to either a network jack or to your network or broadband device. Connect the other end of the network cable to the network adapter connector on the back panel of your computer. A click indicates that the network cable has been securely attached. On computers with a network connector card, use the connector on the card. It is recommended that you use Category 5 wiring and connectors for your network. If you must use Category 3 wiring, force the network speed to 10 Mbps to ensure reliable operation.  network or broadband jack

13	USB 2.0 connectors (6)	Use the back USB connectors for devices that typically remain connected, such as printers and keyboards. It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks or cameras.
14	keyboard connector	If you have a standard keyboard, plug it into the purple keyboard connector. If you have a USB keyboard, plug it into a USB connector.
15	mouse connector	Plug a standard mouse into the green mouse connector. Turn off the computer and any attached devices before you connect a mouse to the computer. If you have a USB mouse, plug it into a USB connector.
16	serial connector (COM 2)	Connect a serial device, such as a handheld device, to the serial port.
17	parallel connector	Connect a parallel device, such as a printer, to the parallel connector. If you have a USB printer, plug it into a USB connector.
18	serial connector (COM 1)	Connect a serial device, such as a handheld device, to the serial port.

Before You Begin

This section provides procedures for removing and replacing the components. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Precautionary Measures" (see page 81).
- You have read the safety information on page 13.
- You have opened the computer cover.

Recommended Tools

Your computer is primarily a tool-less one, but certain procedures (such as removing the heat-sink blower or the control panel) require the use of one or more of the following tools:

- Small flat-blade screwdriver
- #1 and #2 Phillips-head screwdriver
- An 8-inch, #2 Phillips-head screwdriver

It is recommended that you use a wrist grounding strap as explained in "Precautionary Measures" (see page 81).

Precautionary Measures

Use the following safety guidelines to help protect your computer from potential damage and to ensure your own personal safety.

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

CAUTION: Do not attempt to service the computer yourself, except as explained in your online Dell™ documentation or in instructions otherwise provided to you by Dell. Always follow installation and service instructions closely.

NOTICE: To help avoid possible damage to the system board, wait 5 seconds (or wait until the standby light is extinguished) after turning off the computer and unplugging the power cable before removing a component from the system board or disconnecting a device from the computer.

Before you start to work on the computer, perform the following steps in the sequence listed:

1. Shut down the computer through the **Start** menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Disconnect any telephone or telecommunication lines from the computer.
4. Disconnect your computer and all attached devices from electrical outlets, and then press the power button to ground the system board.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

In addition, take note of these safety guidelines when appropriate:

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

- Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a microprocessor chip by its edges, not by its pins.

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch any of your computer's electronic components, such as the microprocessor. You can do so by touching an unpainted metal surface on the computer chassis.

As you continue to work inside the computer, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

Opening the Computer Cover

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

1. Follow the instructions in "Before You Begin" on page 80.
2. If you have installed a padlock through the padlock ring on the back panel, remove the padlock.

NOTICE: Ensure that sufficient space exists to accommodate the open cover—at least 30 cm (1 ft) of desk top space.

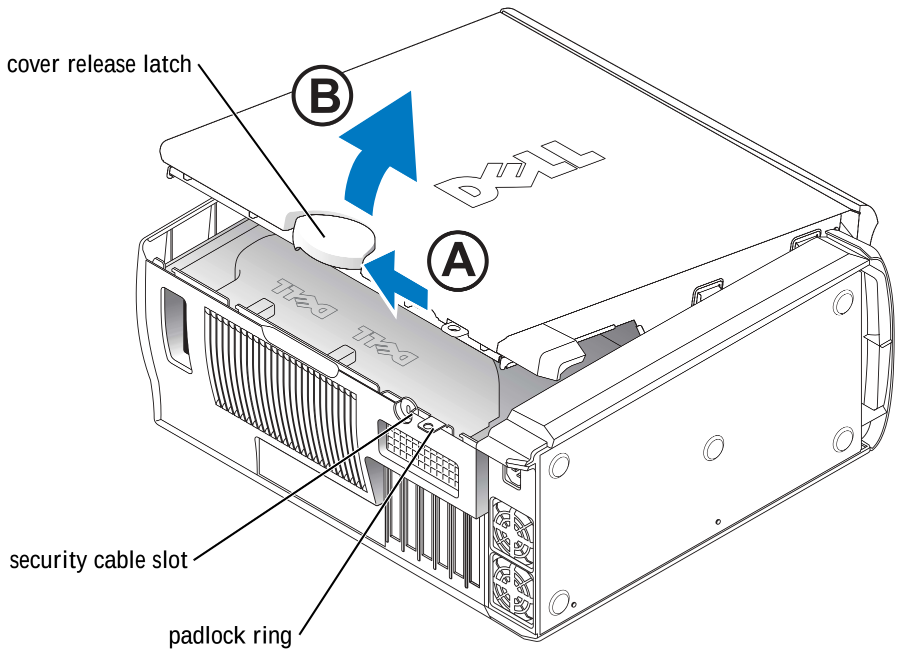
NOTICE: Be careful when opening the computer cover to ensure that you do not accidentally disconnect cables from the system board.

3 Lay the computer on its side with the cover release latch on the top as shown in the following figure.

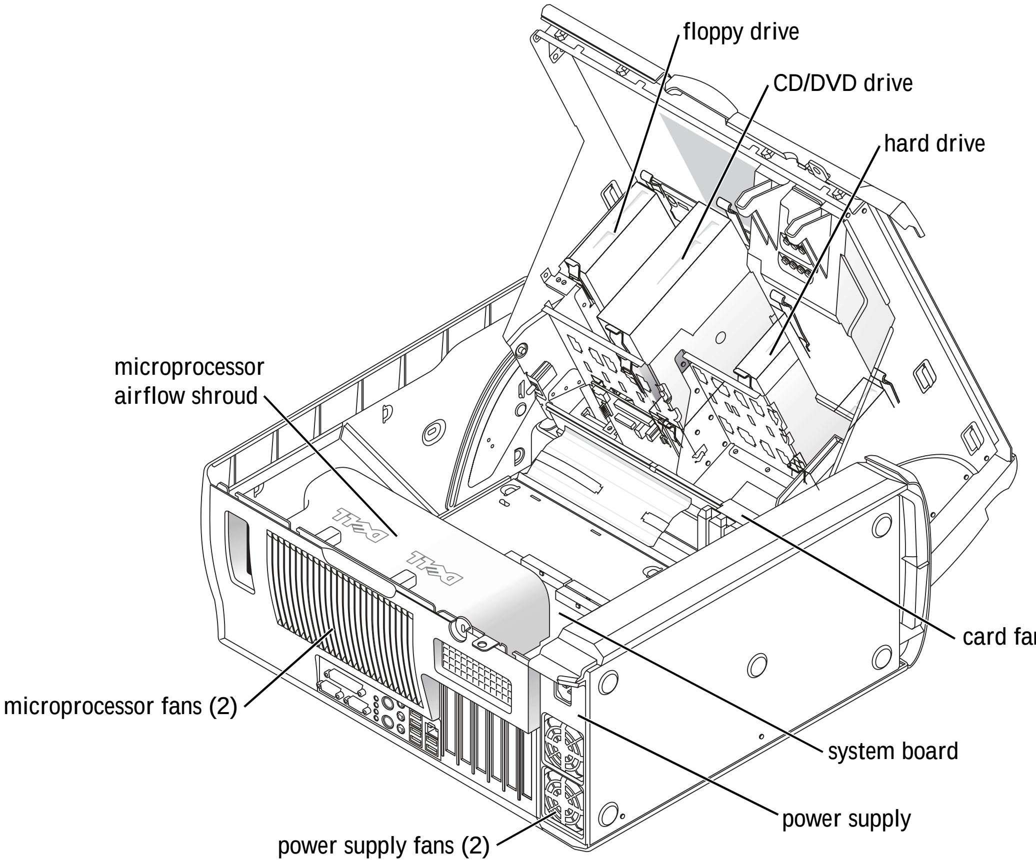
4 Open the computer cover:

a Slide the cover release latch toward the top of the computer.

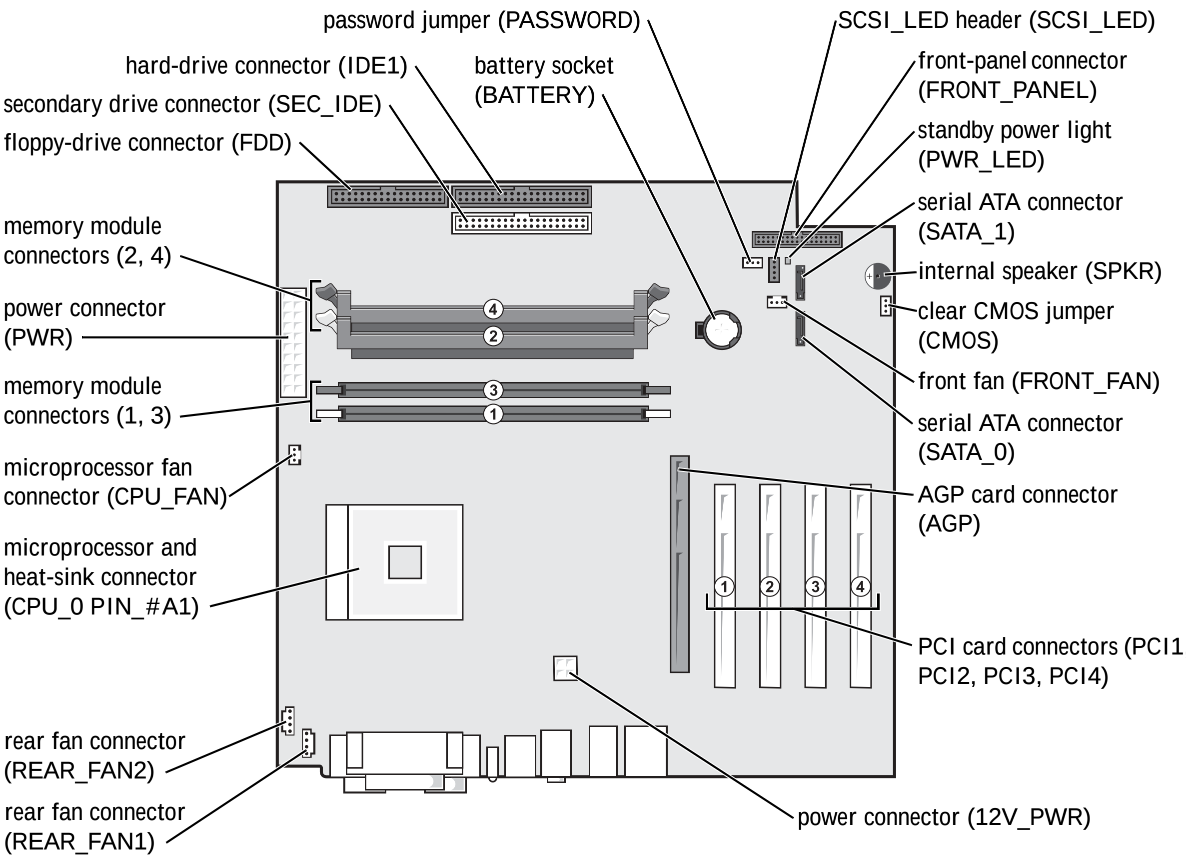
b Raise the cover, and pivot it toward the front of the computer.



Inside View of Your Computer



System Board Components



Memory

You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see "Memory" on page 120.

NOTE: DDR 333 memory operates at 320-MHz when used with an 800-MHz front-side bus processor.

DDR Memory Overview

DDR memory modules should be installed in *pairs of matched memory size*. This means that if you purchased your computer with 256 MB of memory installed and you want to add another 256 MB of memory, you must install it in the appropriate connector. If the DDR memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance.

NOTE: Always install DDR memory modules in the order indicated on the system board.

The recommended memory configurations are:

- A pair of matched memory modules installed in connectors DIMM1 and DIMM2

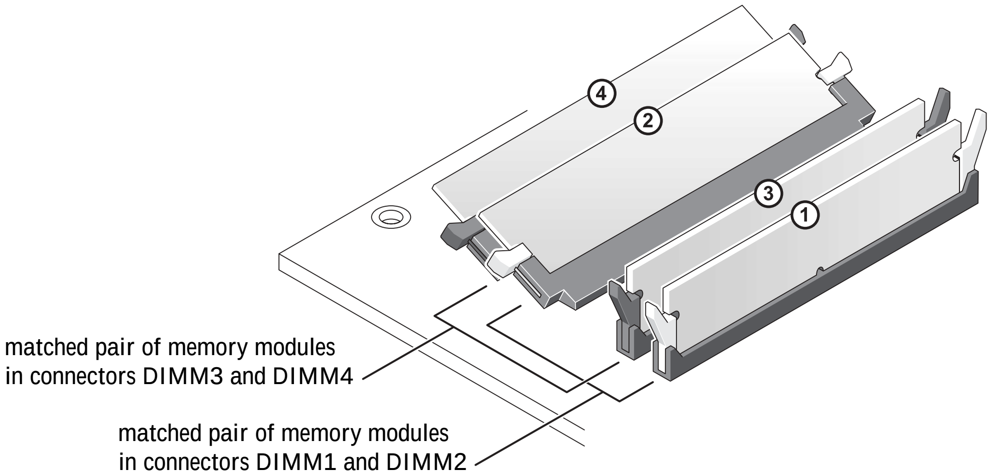
  or

- A pair of matched memory modules installed in connectors DIMM1 and DIMM2 and another matched pair installed in connectors DIMM3 and DIMM4

Additional memory recommendations include:

- Do not install ECC memory modules.
- If you install mixed pairs PC2700 (DDR 333-MHz) and PC3200 (DDR 400-MHz) of memory modules, they function at the slowest speed of the modules you install.
- Be sure to install a single memory module in DIMM 1 or the connector closest to the processor before you install modules in the other connectors.

Memory Installation Guidelines



NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. You should install your original memory modules in pairs either in connectors DIMM1 and DIMM2 or connectors DIMM3 and DIMM4. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not function at optimal performance.

NOTE: Memory purchased from Dell is covered under your computer warranty.

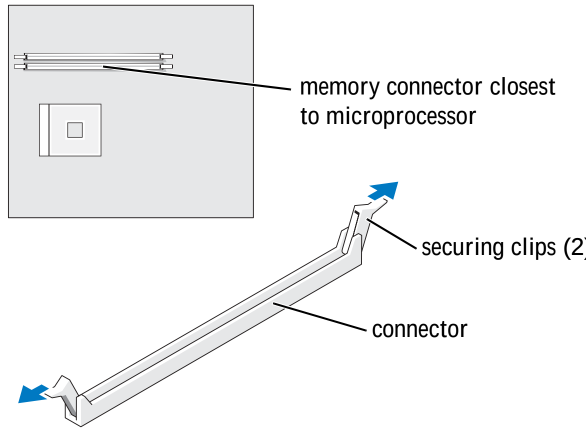
Installing Memory

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

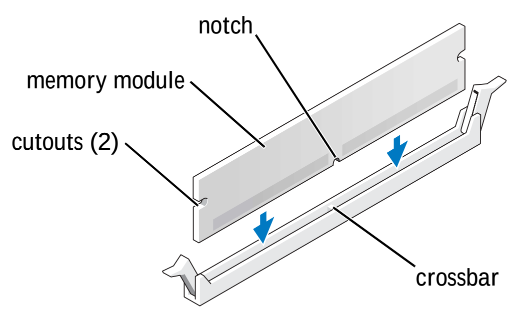
1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
4. If necessary, remove a memory module:
   a. Press out the securing clip at each end of the memory module connector.
   b. Grasp the module and pull up.

      If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

5 To insert a module, press out the securing clip at each end of the memory module connector.



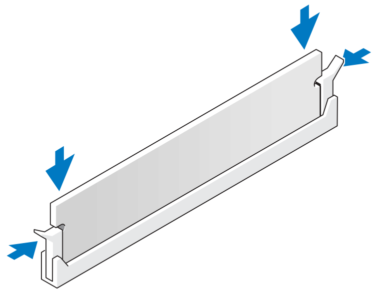
6 Align the notch on the bottom of the module with the crossbar in the connector.



NOTICE: To avoid breaking the memory module, do not press near the middle of the module.

7 Insert the module straight down into the connector, ensuring that it fits into the vertical guides at each end of the connector. Press firmly on the ends of the module until it snaps into place.

If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



8 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

10 Click the **Start** button, right-click **My Computer**, and then click **Properties**.

11 Click the **General** tab.

12 To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

PCI Cards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

Your Dell™ computer provides slots for up to four 32-bit, 33-MHz cards. For more information, see "Specifications" on page 120.

NOTE: For optimum performance, install a PCI sound card only in PCI slot 3 or 4 and a modem card only in PCI slot 2, 3, or 4.

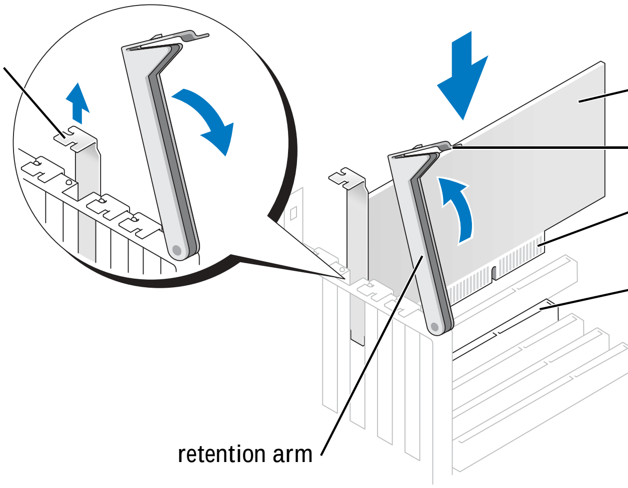
Installing a PCI Card

1 If you are replacing a card, remove the current driver for the card from the operating system.

2 Follow the instructions in "Before You Begin" on page 80.

3 Open the computer cover (see page 82).

4 Press the lever on the card retention arm and raise the retention arm.



5 If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 7.

6 If you are replacing a card that is already installed in the computer, remove the card (see page 92).

   If necessary, disconnect any cables connected to the card. Grasp the card by its top corners, and ease it out of its connector.

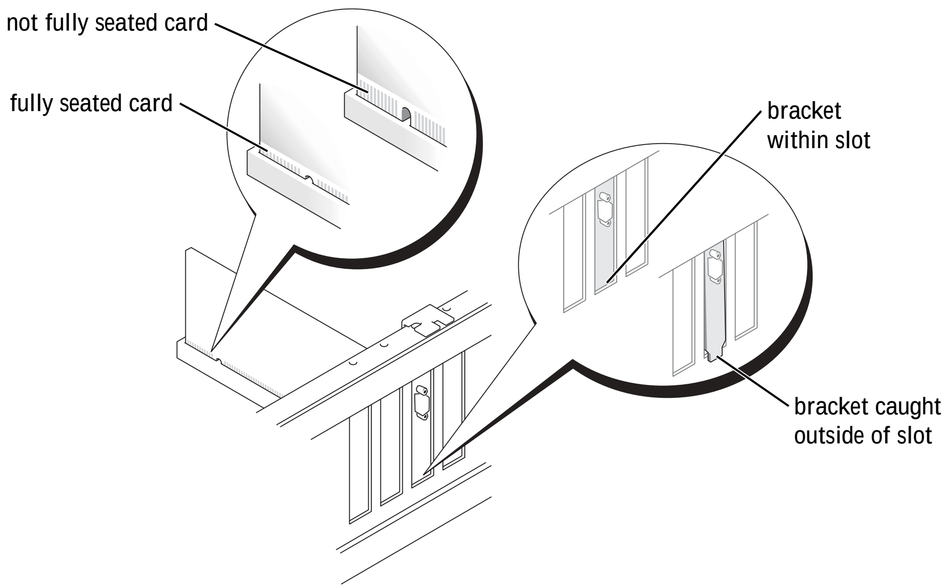
7 Prepare the card for installation.

   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

8 Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.

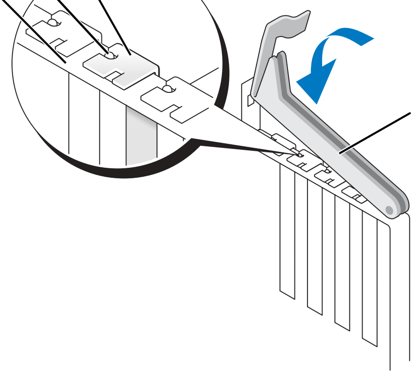
   If the card is full-length, insert the end of the card into the card guide bracket as you lower the card toward its connector on the system board. Insert the card firmly into the card connector on the system board.



9 Before you lower the retention arm, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.

10 Press the retention arm into place, securing the card(s) in the computer.



NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

11 Connect any cables that should be attached to the card.

See the documentation for the card for information about the card's cable connections.

12 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

13 Connect your computer and devices to electrical outlets, and then turn them on.

14 Install any drivers required for the card as described in the card documentation.

Removing a PCI Card

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Press the lever on the card retention arm and raise the retention arm.

4 If necessary, disconnect any cables connected to the card.

5 Grasp the card by its top corners, and ease it out of its connector.

6 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

If you need a filler bracket, contact Dell (see page 129).

NOTE: You must install filler brackets over empty card-slot openings to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

7 Lower the retention arm and press it into place, securing the card(s) in the computer.

8 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and then turn them on.

10 Remove the card's driver from the operating system.

AGP Cards

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

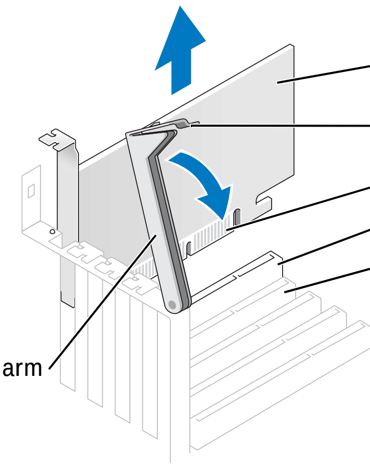
Your Dell™ computer provides a connector for an AGP card.

Removing an AGP Card

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Press the lever on the card retention arm and raise the retention arm.



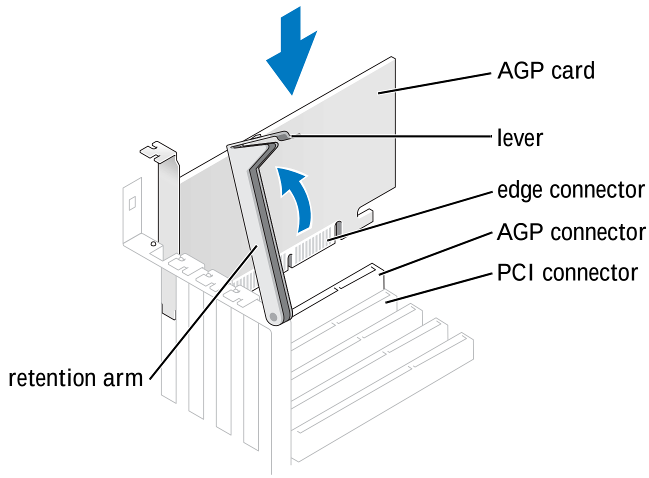
4 Pull the card up and out of the card clip.

Installing an AGP Card

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Press the lever on the card retention arm and raise the retention arm.



4 Gently press the card into the AGP connector until it clicks into place, ensuring that the tab fits into the notch on the front end of the card.

5 Lower the retention arm and press it into place, securing the card(s) in the computer.

6 Close the computer cover (see page 117).

7 Connect the monitor cable to the card's video connector.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and turn them on.

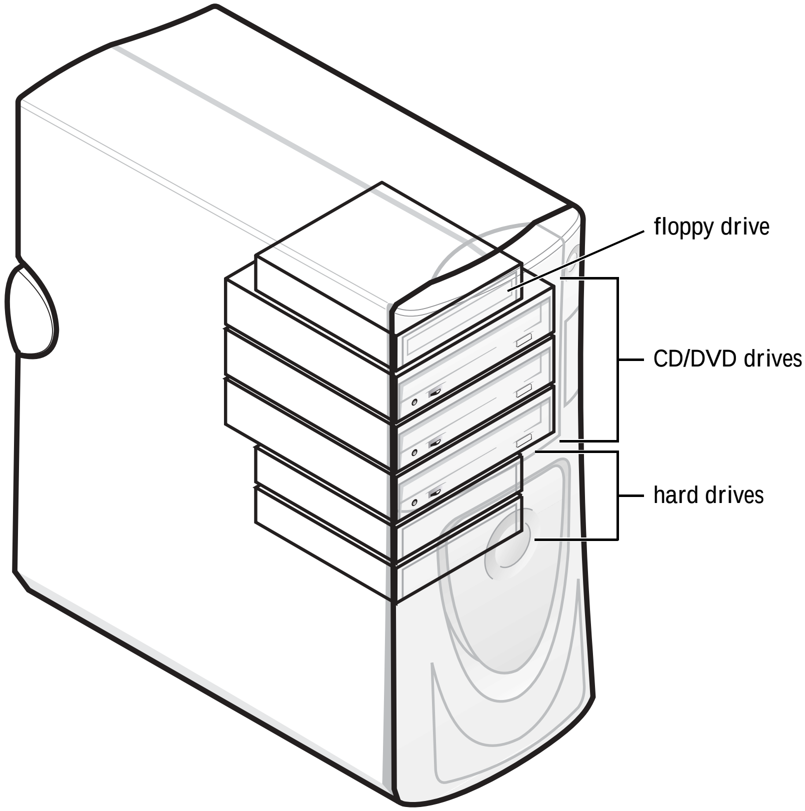
Drives

Overview

Your computer supports one floppy drive and a maximum combination of up to four of any of the following drives.

NOTE: Install only IDE hard drives *or* serial ATA hard drives in your computer. You cannot install both types of drives.

- Two hard drives (IDE, Serial ATA)
- Two CD or DVD drives

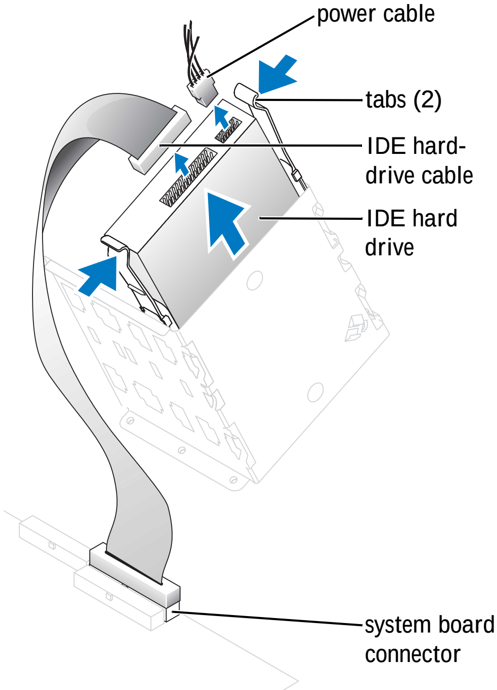


Hard Drive

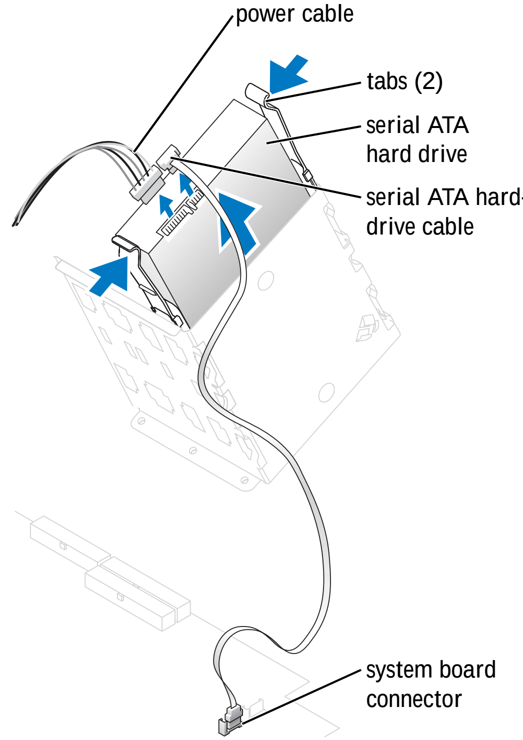
⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions page 13.**

Removing a Hard Drive

1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. Disconnect the power and hard-drive cables from the drive.



IDE hard drive example



serial ATA hard drive example

4 Press in on the tabs on each side of the drive and slide the drive up and out.

Installing a Hard Drive

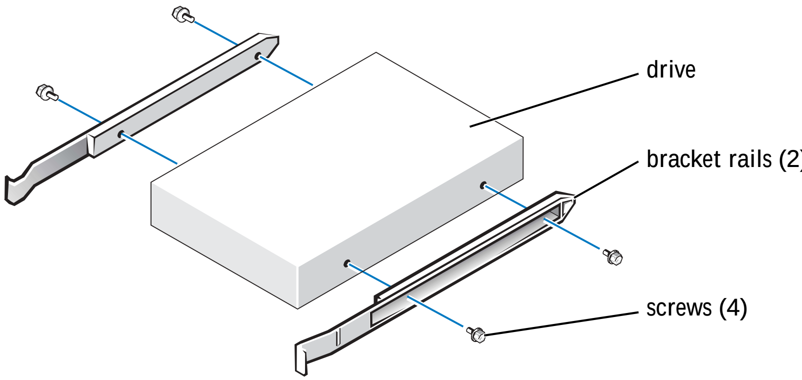
1 Unpack the replacement hard drive, and prepare it for installation.

2 Check the documentation for the drive to verify that it is configured for your computer.

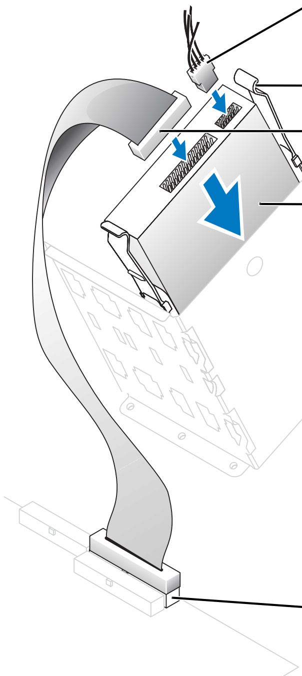
3 Follow the instructions in "Before You Begin" on page 80.

4 Open the computer cover (see page 82).

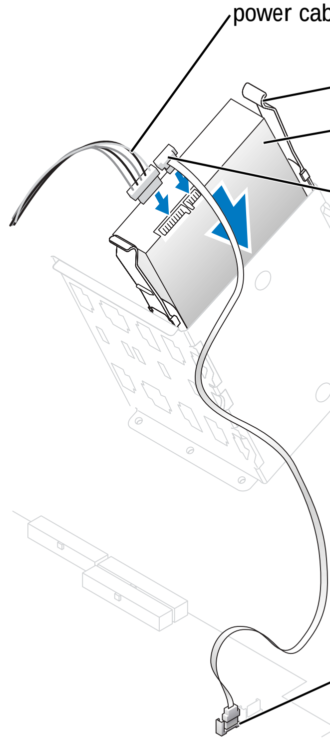
5 If your replacement hard drive does not have the bracket rails attached, remove the rails from the old drive by removing the two screws that secure each rail to the drive. Attach the bracket rails to the new drive by aligning the screw holes on the drive with the screw holes on the bracket rails and then inserting and tightening all four screws (two screws on each rail).



6 Install the hard drive into the computer by gently sliding the drive into place until you hear it click securely.



IDE hard drive example



serial ATA hard drive example

7 Connect the power and hard-drive cables to the drive.

8 Check all connectors to be certain that they are properly cabled and firmly seated.

9 Close the computer cover (see page 82).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

10 Connect your computer and devices to electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Floppy Drive

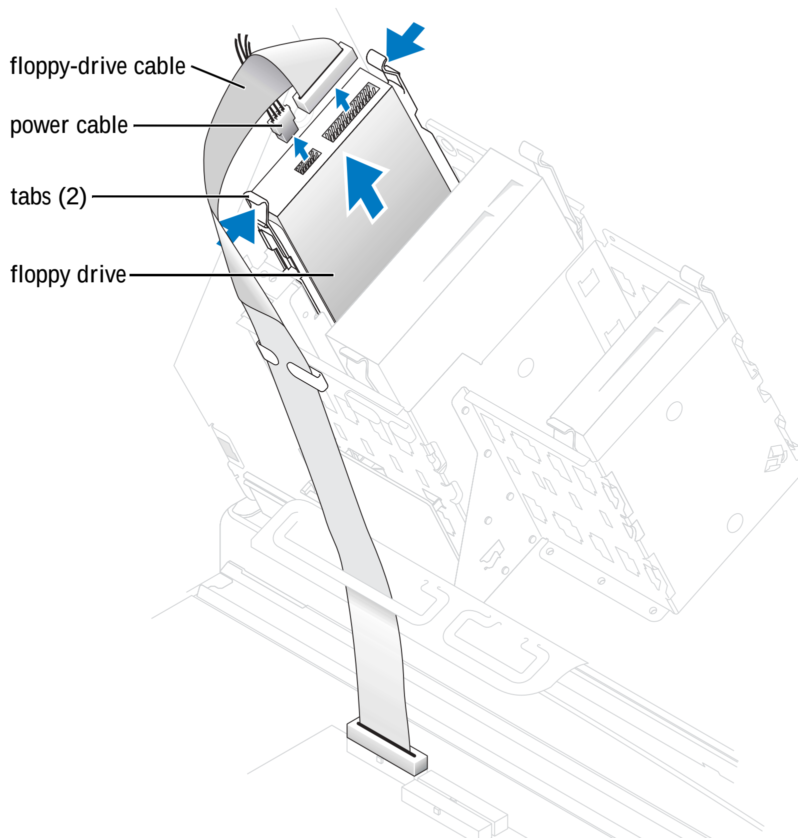
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions page 13.

Removing a Floppy Drive

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

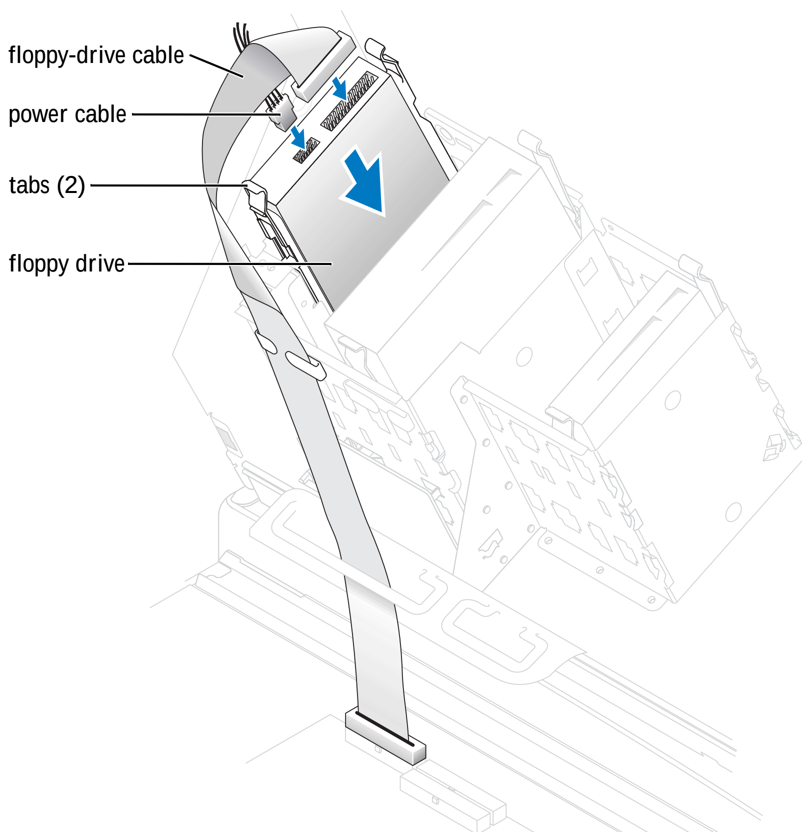
3 Disconnect the power and floppy-drive cables from the back of the floppy drive.



4 Press inward on the two tabs on the sides of the drive, slide the drive upward, and remove it from the floppy-drive bay.

Installing a Floppy Drive

1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. If you are replacing a drive and the the new drive does not have the bracket rails attached, remove the rails from the old drive by removing the two screws that secure each rail to the drive. Attach the bracket to the new drive by aligning the screw holes on the drive with the screw holes on the bracket rails and then inserting and tightening all four screws (two screws on each rail). See the diagram on page 98.
4. Gently slide the drive into place until the tabs securely click into position.



5. Attach the power and floppy-drive cables to the floppy drive.

6 If you are installing a new floppy drive rather than replacing a drive, remove the front-panel inserts.

From inside the drive bay, gently press on each side of the insert until it pops out.

7 Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

8 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

CD/DVD Drive

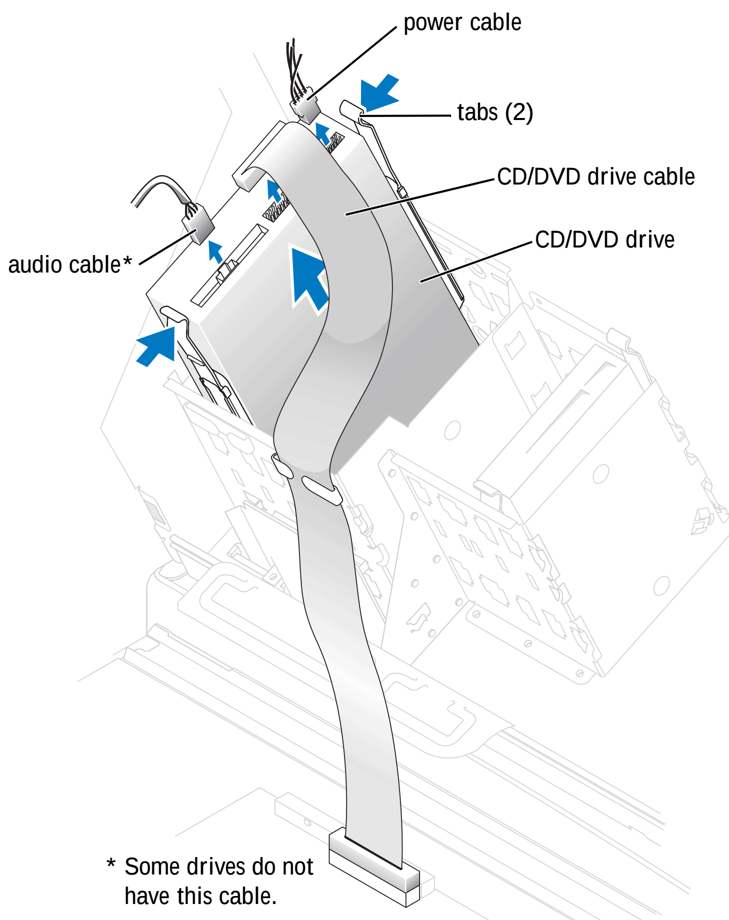
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

Removing a CD/DVD Drive

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Disconnect the power and CD/DVD drive cables from the back of the drive.



4 Press inward on the two tabs on the sides of the drive, and then slide the drive upward and remove it from the drive bay.

Installing a CD/DVD Drive

1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

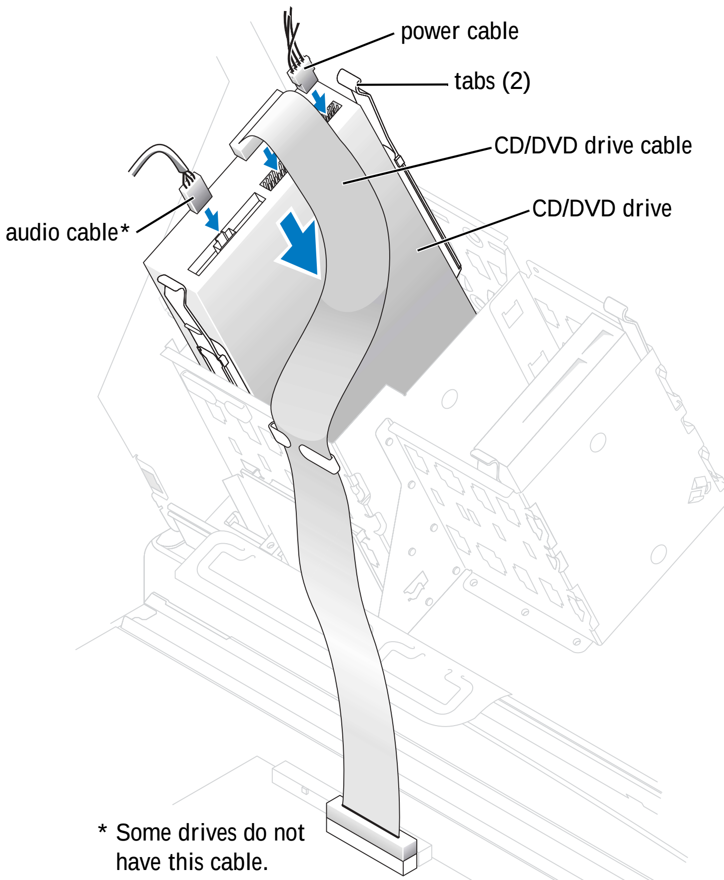
3 If you are installing a new drive, unpack the drive and prepare it for installation.

Check the documentation that accompanied the drive to verify that the drive is configured for your computer. If you are installing an IDE drive, configure the drive for the cable select setting.

4 Connect the new drive to the set of rails that are attached to the inside of the cover. If a set of rails is not attached inside the computer cover, contact Dell (see page 129).

5 If you are installing a replacement drive and the new drive does not have the bracket rails attached, remove the rails from the old drive by removing the two screws that secure each rail to the drive. Attach the bracket to the new drive by aligning the screw holes on the drive with the screw holes on the bracket rails and then inserting and tightening all four screws (two screws on each rail). See the diagram on page 98).

6 Gently slide the drive into place until the tabs securely click into position.



7 Connect the power and CD/DVD drive cables to the drive.

If you are adding a drive that has an audio cable, connect the audio cable to the audio connector on the audio card.

8 If you are installing a new CD/DVD drive rather than replacing a drive, remove the front-panel inserts.

From inside the drive bay, gently press on each side of the insert until it pops out.

9 If you are installing a drive that has its own controller card, install the controller card in an expansion slot.

See the documentation that accompanied the drive and controller card to verify that the configuration is correct for your computer..

10 Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

11 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

12 Connect your computer and devices to electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Microprocessor Airflow Shroud

CAUTION: Before you perform this procedure, follow the safety instructions on page 13.

Removing the Microprocessor Airflow Shroud

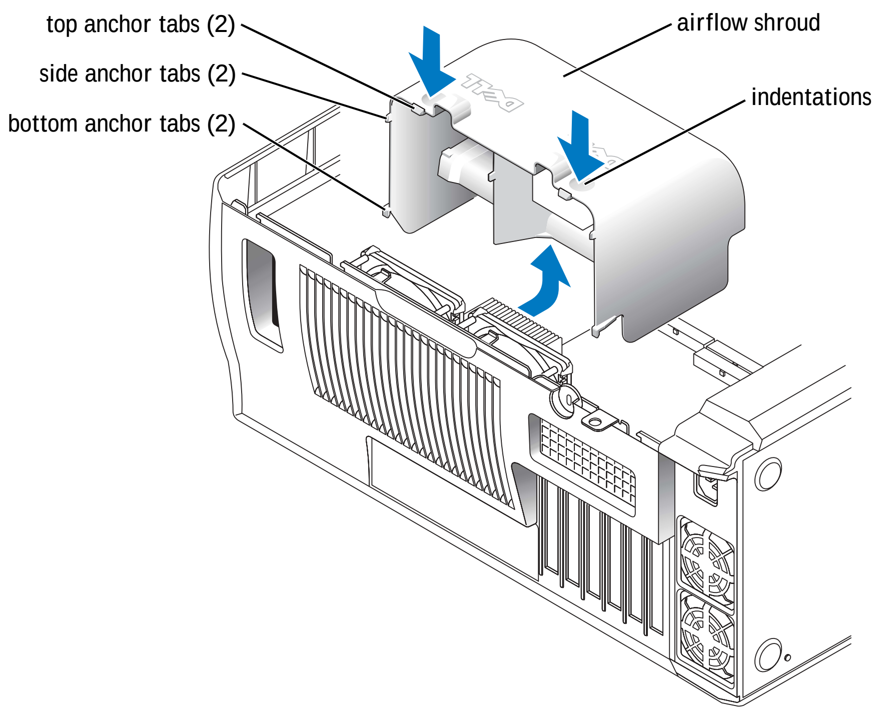
1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Press down and back on the indentations at the top corners of the shroud.

The top anchor tabs disengage from the anchor slots.

4 Lift the airflow shroud out of the chassis.



Installing the Microprocessor Airflow Shroud

1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. Insert the bottom anchor tabs into the anchor slots.
4. Align and insert the side anchor tabs into the anchor slots.
5. Press the indentations until the top anchor tabs on the shroud snap securely into place.
6. Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

Microprocessor

CAUTION: Before you perform this procedure, follow the safety instructions on page 13.

Installing the Microprocessor

NOTE: It is recommended that only a technically knowledgeable person perform this procedure.

CAUTION: The processor can get very hot during normal operation. Ensure that the processor has had sufficient time to cool before you touch it.

1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. Remove the microprocessor airflow shroud (see page 105).

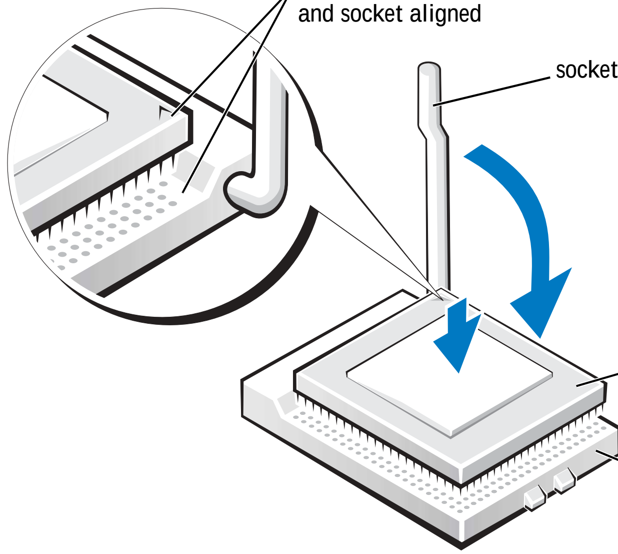
   If you are replacing a microprocessor, follow steps 4, 5, and 6 in "Removing the Microprocessor" on page 109.

NOTICE: You must position the microprocessor correctly in the socket to avoid permanent damage to the microprocessor and the computer.

4. If the release lever is not extended to the release position, move it to that position.
5. Align pin-1 (the imprinted corner) of the microprocessor and pin-1 of the socket.

NOTICE: Microprocessor pins are delicate. To avoid damage, ensure that the microprocessor aligns properly with the socket, and do not use excessive force when you install the processor.

6. Carefully set the microprocessor in the socket and press it down lightly to seat it.
7. Rotate the release lever back toward the system board until it snaps into place, securing the microprocessor.



8 Install the heat sink:

a Insert the notched end of the heat sink onto the end of the retention base that is opposite the hinge.

b Lower the heat sink until it fits securely in the base.

c When the heat sink is secured, pivot the rentention module clip back until the tab snaps into place to secure the heat sink.

9 If you installed a microprocessor replacement kit from Dell, return the original heat sink assembly and microprocessor to Dell in the same package in which your replacement kit was sent.

10 Replace the airflow shroud (see page 106).

11 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

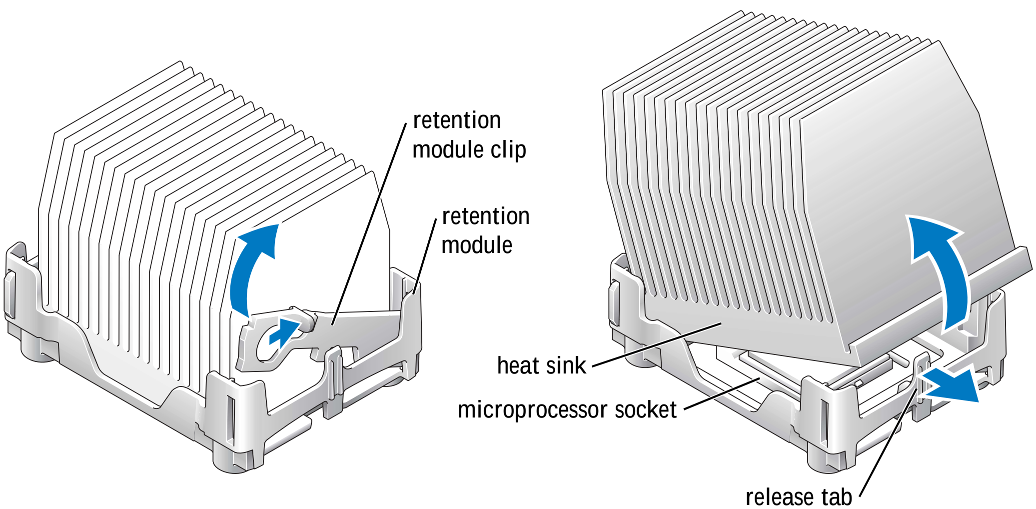
12 Connect your computer and devices to electrical outlets, and turn them on.

Removing the Microprocessor

NOTE: It is recommended that only a technically knowledgeable person perform this procedure.

CAUTION: The processor can get very hot during normal operation. Ensure that the processor has had sufficient time to cool before you touch it.

1. Follow the instructions in "Before You Begin" on page 80.
2. Open the computer cover (see page 82).
3. Remove the microprocessor airflow shroud (see page 105).
4. Remove the microprocessor heat sink:
   a. Remove the retention module clip by pressing in on the tab and lifting the retention module clip up.
   b. Pull the release lever out until the heat sink is released.
   c. Lift the heat sink away from the microprocessor.

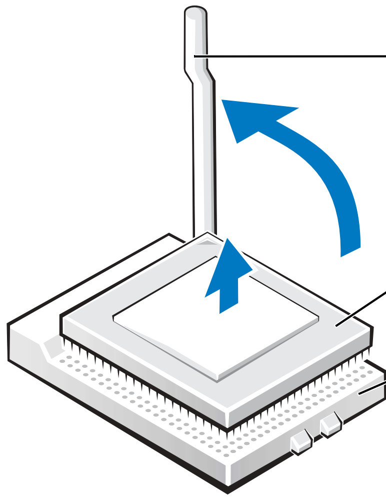


NOTICE: Lay the heat sink down with the thermal grease facing upward.

NOTICE: If you are installing a microprocessor upgrade kit from Dell, discard the original heat sink. If you are *not* installing a microprocessor upgrade kit from Dell, reuse the original heat sink when you install your new microprocessor.

5. Pull the release lever straight up until the microprocessor is released.

NOTICE: Be careful not to bend any of the pins when you remove the microprocessor from the socket. Bending the pins can permanently damage the microprocessor.



6 Remove the microprocessor from the socket.

If you are replacing the microprocessor, leave the release lever extended in the release position so that the socket is ready for the new microprocessor and go to "Installing the Microprocessor" on page 107.

7 Replace the airflow shroud (see page 106).

8 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

9 Connect your computer and devices to electrical outlets, and turn them on.

Front Panel

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

Removing the Front Panel

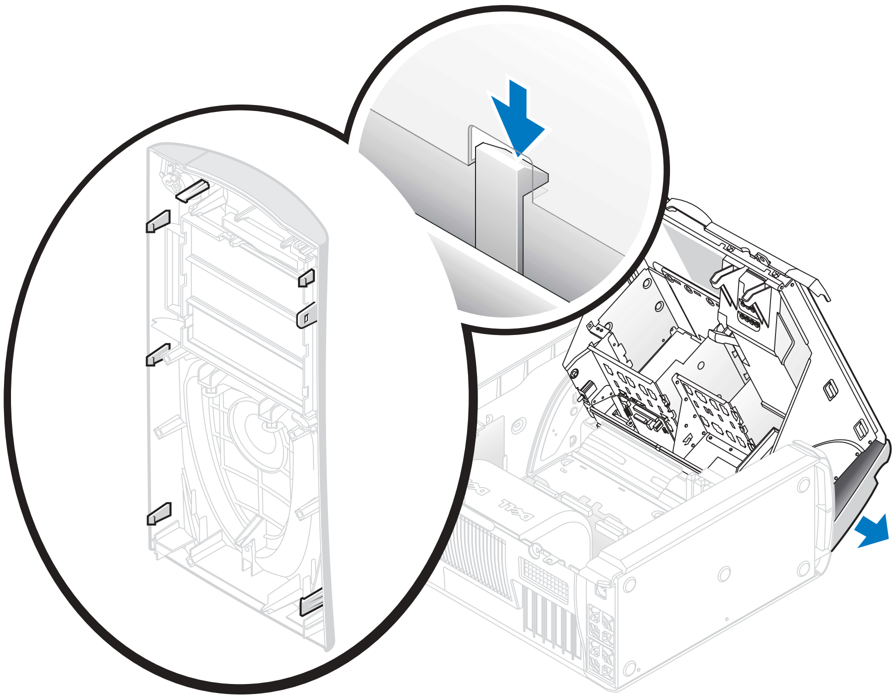
1 Follow the instructions in "Before You Begin" on page 80.

2 Open the computer cover (see page 82).

3 Disconnect and remove all disk drives (see "Drives" on page 95).

4 Release the front panel by pressing each of the front-panel release tabs.

There are seven release tabs.



5 Close the computer cover halfway and pull the front panel away from the computer.

Replacing the Front Panel

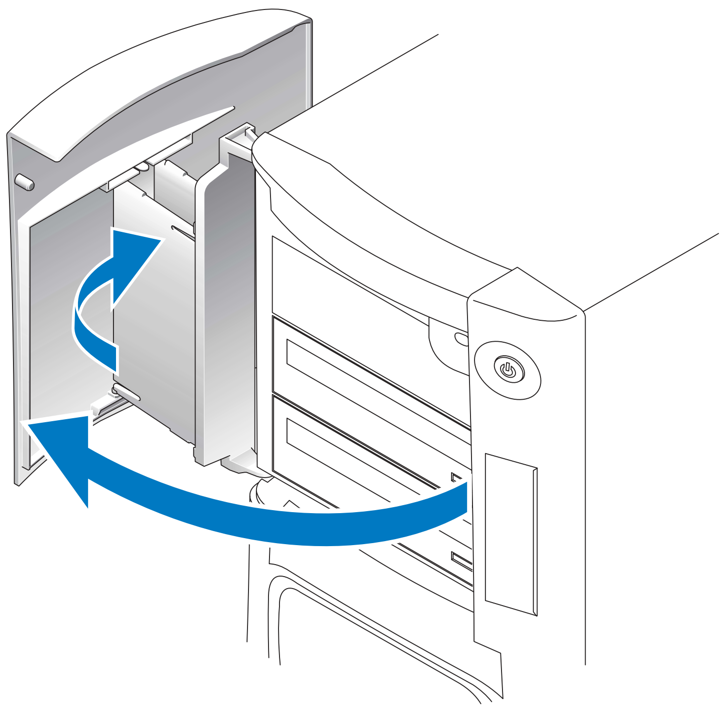
To replace the front panel, perform the removal procedure in reverse.

Drive Door

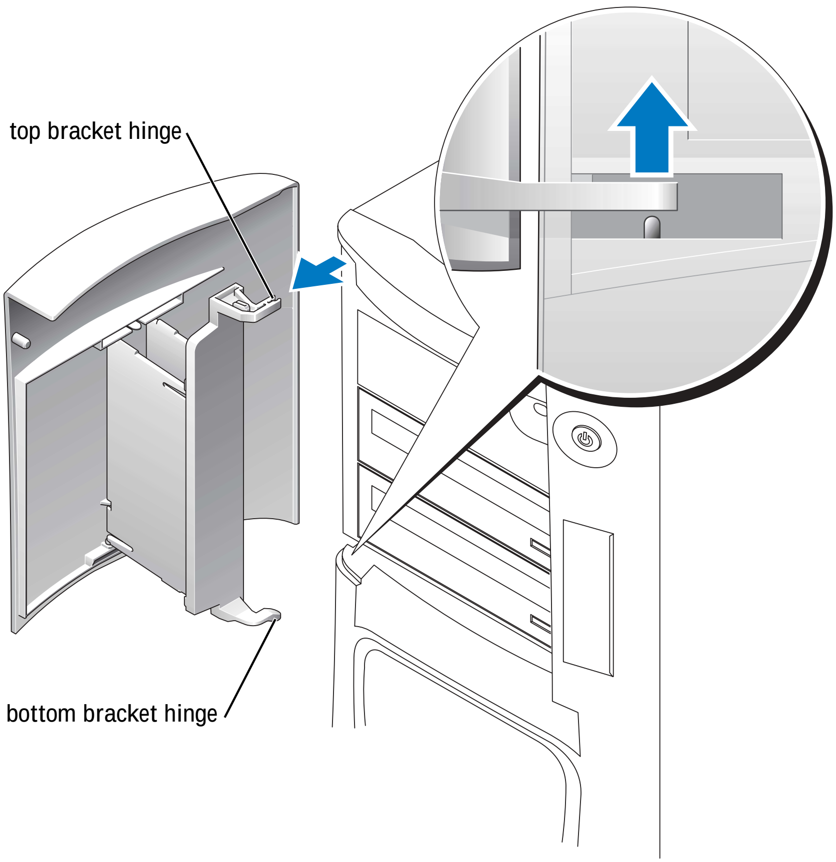
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

Removing the Drive Door

1 Open the drive door.



2 Unsnap the top bracket hinge and pull the top of the drive door outward, away from the computer.



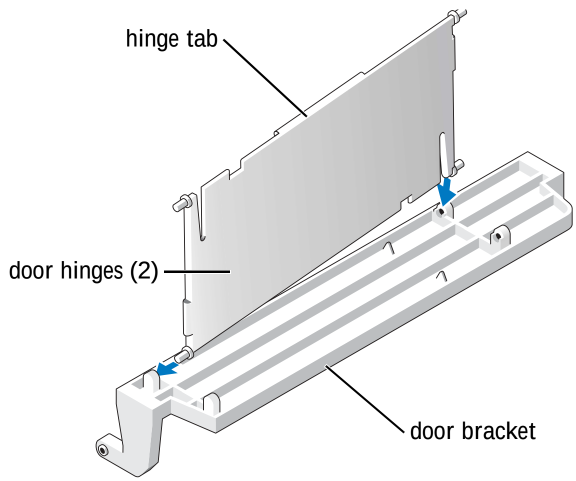
3 Lift the bottom bracket hinge away from the computer.

Replacing the Drive Door

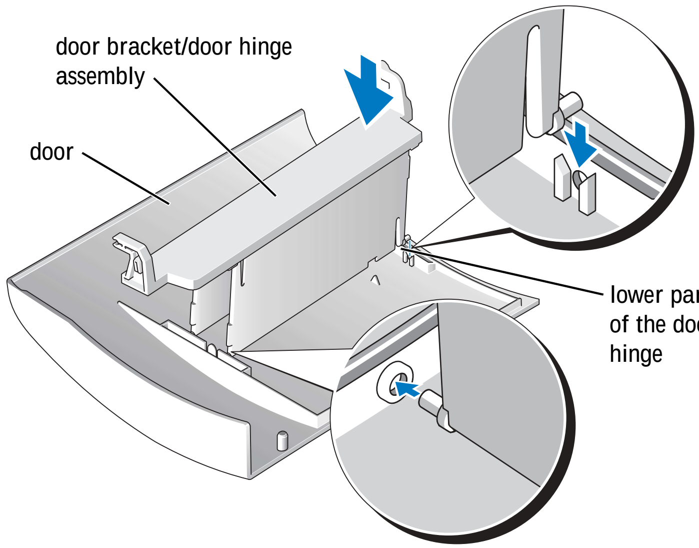
To prevent damage to your computer, the drive door is designed to "break away" from the computer if it is opened too far. If the drive door detaches from the computer without disassembling, perform the removal procedure in reverse.

If the drive door is open and it is opened too far, instead of breaking away from the computer in one piece, the drive door may disassemble into several smaller pieces. If the drive door disassembles:

1 If necessary, reattach the door hinges to the door bracket. Ensure that the hinge tabs are away from the door bracket.



2 Attach the door bracket/door hinge assembly to the door, starting with the lower part of each door hinge.



3 Attach the drive door to the computer, starting with the bottom bracket hinge.

Battery

⚠ **CAUTION: Before you begin this procedure, follow the safety instructions on page 13.**

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

⚠ **CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

To replace the battery:

1 Record all the screens in the system setup program (see page 124) so that you can restore the correct settings in step 9.

2 Follow the instructions in "Before You Begin" on page 80.

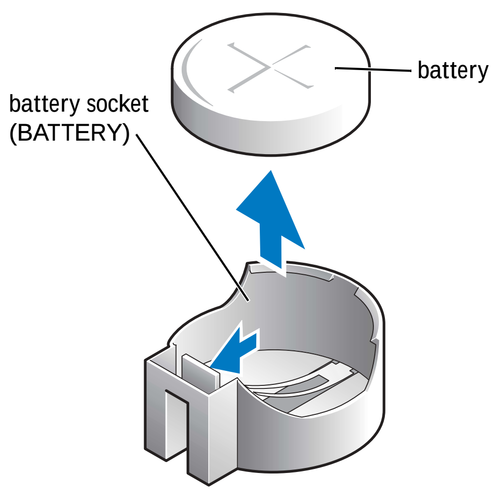
3 Open the computer cover (see page 82).

4 Locate the battery socket (see page 85).

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

5 Remove the battery by carefully prying it out of its socket with your fingers or with a blunt, nonconducting object such as a plastic screwdriver.

6 Insert the new battery into the socket with the side labeled "+" facing up, and snap the battery into place.



7 Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and turn them on.

9 Enter the system setup program (see page 124) and restore the settings you recorded in step 1.

10 Properly dispose of the old battery (see page 18).

Closing the Computer Cover

1 Ensure that all cables are connected, and fold cables out of the way.

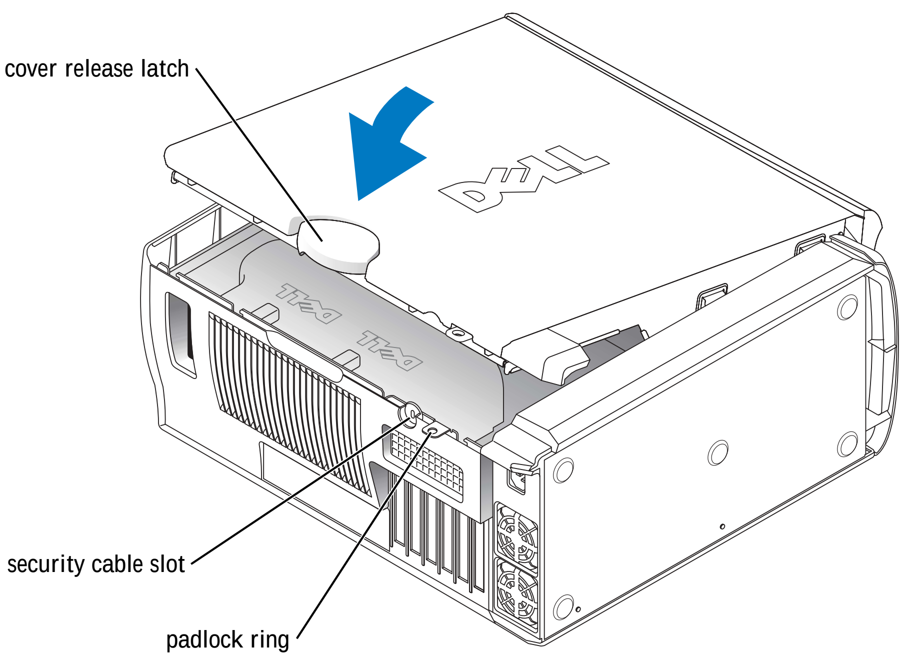
2 Ensure that no tools or extra parts are left inside the computer.

3 Close the computer cover:

   a Pivot the cover down and into position.

   b Press down on the cover to close it.

   c Once the cover is closed, slide the cover release latch to the right until the latch clicks into place.



4 If you are using a padlock to secure your computer, install the padlock.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

5 Connect your computer and devices to electrical outlets, and turn them on.

6

SECTION 6

Appendix

Specifications

Microprocessor	
Microprocessor type	Intel® Pentium® 4
Level 1 (L1) cache	8 KB
Level 2 (L2) cache	512-KB

Memory	
Type	400- and 333-MHz DDR SDRAM
Memory connectors	four
Memory capacities	128-, 256-, or 512- non–ECC
Minimum memory	256 MB
Maximum memory	2 GB
BIOS address	F0000h

Computer Information	
Chip set	Intel 875P
DMA channels	eight
Interrupt levels	24
BIOS chip	4-Mb
NIC	integrated PCI network interface
System clock	533- or 800-MHz data rate

Video	
Type	AGP 8X

Expansion Bus	
Bus type	PCI and AGP
Bus speed	PCI: 33-MHz AGP: 133-MHz
AGP:	
connector	one
connector size	172 pins
connector data width (maximum)	32 bits
bus protocols	8x/4x/2x modes at 1.5 V
PCI:	
connector	four
connector size	120 pins
connector data width (maximum)	32 bits

Drives	
Externally accessible	one 3.5-inch drive bay three 5.25-inch drive bays
Available devices	ATA-100 Ultra DMA hard drive, serial ATA drive, CD drive, DVD drive, RAID
Internally accessible	three 3.5-inch drive bays

Connectors	
External connectors:	
Serial	two 9-pin connectors; 16550C-compatible
Parallel	25-hole connector (bidirectional)
Network adapter	10/100/1000 Ethernet connector
PS/2 (keyboard and mouse)	6-pin mini-DIN
USB	two front-panel and six back-panel USB 2.0–compliant connectors
headphones	one front-panel connector
System board connectors:	
Primary IDE drive	40-pin connector
Secondary IDE drive	40-pin connector
Floppy drive	34-pin connector
Fans (3)	3-pin connector
I/O Panel	34-pin connector
Serial ATA (2)	7-pin connector

Controls and Lights	
Power control	push button
Power light	green light on power button—blinking green in sleep state; solid green for power-on state
Hard-drive access light	green
Link integrity light (on integrated network adapter)	green light for 10-Mb operation; orange light for 100-Mb operation
Activity light (on integrated network adapter)	yellow blinking light
Diagnostic lights	four lights on the back panel

Power	
DC power supply:	
Wattage	460 W
Heat dissipation	1000 BTU/hr
Voltage (see page 15 for important voltage setting information)	fixed-voltage power supply—110 V at 50/60 Hz manual selection and auto-sensing power supplies—90 to 135 V at 50/60 Hz; 180 to 265 V at 50/60 Hz; 100 V at 50/60 Hz for Japanese computers
Backup battery	3-V CR2032 lithium coin cell

Physical	
Height	49.1 cm (19.3 inches)
Width	22.2 cm (8.7 inches)
Depth	48.8 cm (19.2 inches)
Weight	19 kg (42 lbs)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F) **NOTE:** At 35°C (95°F), the maximum operating altitude is 914 m (3000 ft).
Storage	–40° to 65°C (–40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 0.5 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 20 inches/sec (50.8 cm/sec)

Environmental	
Storage	nonoperating (half-sine pulse) 105 G, 2 ms
	nonoperating (faired-square wave) 27 G with a velocity change of 508 cm/sec (200 inches/sec)
Altitude:	
Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

Standard Settings

The system setup program contains the standard settings for your computer.

NOTICE: Unless you are an expert computer user, do not change the settings for this program. Certain changes might make your computer work incorrectly.

See the following figure for an example of the main program screen.

```
                        Dell - Dimension XPS

Intel® Pentium® 4 Processor: nnn GHz  |  BIOS Version: nnn
Level 2 Cache: nnn KB Integrated      |  Service Tag:  nnnnn

System Time ..........................................00:00:00
System Date ..........................................DAY/MO/DATE/YR

Drive Configuration ..................................<ENTER>
Hard Disk Drive Sequence .............................<ENTER>
Boot Sequence ........................................<ENTER>

Memory Information ...................................<ENTER>
CPU Information ......................................<ENTER>

Integrated Devices (LegacySelect Options) ............<ENTER>
Power Management .....................................<ENTER>
System Security ......................................<ENTER>

Keyboard Numlock .....................................On
Report Keyboard Errors ...............................Report

Auto Power On ........................................Disabled
Remote Wake Up .......................................Off
Fast Boot ............................................On
OS Install Mode ......................................Off
IDE Hard Drive Acoustics Mode ........................Bypass

System Event Log .....................................<ENTER>

Asset Tag ............................................nnnnn

↓↑ to select  |  SPACE, +, - to change  |  ESC to exit  |  F1 = Help
```

Viewing Settings

1 Turn on (or restart) your computer.

2 When the blue DELL™ logo appears, press <F2> immediately.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer and try again.

System Setup Screens

The system setup program screens display the current configuration information for your computer. Information on the screen is divided into five areas:

- Title — The box at the top of all screens that lists the computer name.
- Computer data — Two boxes below the title box that display your computer processor, L2 cache, service tag, and the version number of the BIOS.
- Options — A scrollable box listing options that define the configuration of your computer, including installed hardware, power conservation, and security features.

  Fields to the right of the option titles contain settings or values. The fields that you can change appear bright on the screen. The fields that you cannot change (because they are set by the computer) appear less bright. When <ENTER> appears to the right of an option title, press <Enter> to access a popup menu of additional options.
- Key functions — A line of boxes across the bottom of all screens that lists keys and their functions within the system setup program.
- Help — Press <F1> for information on the option that is selected (highlighted).

Boot Sequence

This feature allows you to change the boot sequence for devices.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to tell the computer to boot from the CD drive so that you can run the Dell Diagnostics on the *Drivers and Utilities* CD, but you must set the computer to boot from the hard drive when the diagnostic tests are complete.

1. Turn on (or restart) your computer.
2. When the blue DELL logo appears, press <F2> immediately.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then shut down your computer (see page 30) and try again.

   The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.
3. At the bottom of the menu, enter the number of the device that is to be used for the current boot only.

Changing Boot Sequence for Future Boots

1 Enter the system setup program (see page 125).

2 Use the arrow keys to highlight the **Boot Sequence** menu option and press <Enter> to access the pop-up menu.

NOTE: Write down your current boot sequence in case you want to restore it.

3 Press the up- and down-arrow keys to move through the list of devices.

4 Press the spacebar to enable or disable a device (enabled devices have a checkmark).

5 Press plus (+) or minus (–) to move a selected device up or down the list.

Clearing Forgotten Passwords

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions on page 13.

If you forget your user or setup password, you cannot operate your computer or change settings in the system setup program until you clear the forgotten password(s).

NOTICE: This process erases both the system and setup passwords.

1 Shut down the computer (see page 30).

NOTICE: To disconnect a network cable, first unplug the cable from your computer, and then unplug it from the network wall jack.

2 Turn off any attached devices and disconnect them from their electrical outlets.

3 Disconnect the computer power cable from the wall outlet, and then press the power button to ground the system board.

4 Open the computer cover (see page 82).

5 Locate jumper PASSWORD on the system board (see page 85) and remove the jumper plug.

6 Close the computer cover (see page 117), plug your computer into an electrical outlet, and turn on the computer.

   The existing password(s) will be erased.

7 Shut down the computer (see page 30).

NOTICE: To disconnect a network cable, first unplug the cable from your computer, and then unplug it from the network wall jack.

8 Turn off any attached devices and disconnect them from their electrical outlets.

9 Disconnect the computer power cable from the wall outlet, and then press the power button to ground the system board.

10 Open the computer cover (see page 82).

11 Reconnect the jumper plug to jumper PASSWORD (see page 85).

12 Close the computer cover (see page 117).

NOTICE: To connect a network cable, first plug the cable into the network wall jack, and then plug it into the computer.

13 Connect your computer and devices to their electrical outlets, and turn them on.

Turning on your computer with the PASSWORD jumper installed reenables the password feature.

Dell Technical Support Policy (U.S. Only)

Technician-assisted technical support requires the cooperation and participation of the customer in the troubleshooting process and provides for restoration of the operating system, software programs, and hardware drivers to the original default configuration as shipped from Dell, as well as the verification of appropriate functionality of the computer and all Dell-installed hardware. In addition to this technician-assisted technical support, online technical support is available at **support.dell.com**. Additional technical support options may be available for purchase.

Dell provides limited technical support for the computer and any "Dell-installed" software and peripherals[1]. Support for third-party software and peripherals is provided by the original manufacturer, including those purchased and/or installed through Dell Software and Peripherals, Readyware, and Custom Factory Integration[2].

1 Repair services are provided pursuant to the terms and conditions of your limited warranty and any optional support service contract purchased with the computer.

2 All Dell-standard components included in a Custom Factory Integration (CFI) project are covered by the standard Dell limited warranty for your computer. However, Dell also extends a parts replacement program to cover all nonstandard, third-party hardware components integrated through CFI for the duration of the computer’s service contract.

Definition of "Dell-Installed" Software and Peripherals

Dell-installed software includes the operating system and some of the software programs that are installed on the computer during the manufacturing process (Microsoft® Office, Norton Antivirus, and so on).

Dell-installed peripherals include any internal expansion cards, or Dell-branded module bay or PC Card accessories. In addition, any Dell-branded monitors, keyboards, mice, speakers, microphones for telephonic modems, docking stations/port replicators, networking products, and all associated cabling are included.

Definition of "Third-Party" Software and Peripherals

Third-party software and peripherals include any peripheral, accessory, or software program sold by Dell not under the Dell brand (printers, scanners, cameras, games, and so on). Support for all third-party software and peripherals is provided by the original manufacturer of the product.

Contacting Dell

To contact Dell electronically, you can access the following websites:

- **www.dell.com**
- **support.dell.com** (technical support)
- **premiersupport.dell.com** (technical support for educational, government, healthcare, and medium/large business customers, including Premier, Platinum, and Gold customers)

For specific web addresses for your country, find the appropriate country section in the table below.

NOTE: Toll-free numbers are for use within the country for which they are listed.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Canada (North York, Ontario)	Online Order Status: **www.dell.ca/ostatus**	
International Access Code: **011**	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	TechFax	toll-free: 1-800-950-1329
	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
U.S.A. (Austin, Texas)	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: **011**	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
Country Code: **1**	**Consumer** (Home and Home Office)	
	Technical Support	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	DellNet™ Service and Support	toll-free: 1-877-Dellnet (1-877-335-5638)
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Financial Services website: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	Business	
	Customer Service and Technical Support	toll-free: 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Projectors Technical Support	toll-free: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-234-1490
	Dell Sales	toll-free: 1-800-289-3355 or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)

Regulatory Notices

Electromagnetic Interference (EMI) is any signal or emission, radiated in free space or conducted along power or signal leads, that endangers the functioning of a radio navigation or other safety service or seriously degrades, obstructs, or repeatedly interrupts a licensed radio communications service. Radio communications services include but are not limited to AM/FM commercial broadcast, television, cellular services, radar, air-traffic control, pager, and Personal Communication Services (PCS). These licensed services, along with unintentional radiators such as digital devices, including computer systems, contribute to the electromagnetic environment.

Electromagnetic Compatibility (EMC) is the ability of items of electronic equipment to function properly together in the electronic environment. While this computer system has been designed and determined to be compliant with regulatory agency limits for EMI, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference with radio communications services, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and the receiver are on different branch circuits.

If necessary, consult a Dell Technical Support representative or an experienced radio/television technician for additional suggestions.

Limited Warranties and Return Policy

Dell-branded hardware products purchased in the U.S. or Canada come with either a 90-day, 1-year, 2-year, 3-year, or 4-year limited warranty. To determine which warranty came with your hardware product(s), see your packing slip or invoice. The following sections describe the limited warranties and return policy for the U.S., the limited warranties and return policy for Canada, the manufacturer guarantee for Latin America and the Caribbean, and the Intel® Pentium® and Celeron® warranty for the U.S. and Canada.

Limited Warranty for Dell-Branded Hardware Products (U.S. Only)

What is covered by this limited warranty?

This limited warranty covers defects in materials and workmanship in your—our end-user customer's—Dell-branded hardware products, including Dell-branded peripheral products.

What is not covered by this limited warranty?

This limited warranty does not cover:

- Software, including the operating system and software added to the Dell-branded hardware products through our factory-integration system, third-party software, or the reloading of software
- Non-Dell-branded and Solution Provider Direct products and accessories
- Problems that result from:
  - External causes such as accident, abuse, misuse, or problems with electrical power
  - Servicing not authorized by Dell
  - Usage that is not in accordance with product instructions
  - Failure to follow the product instructions or failure to perform preventive maintenance
  - Problems caused by using accessories, parts, or components not supplied by Dell
- Products with missing or altered Service Tags or serial numbers
- Products for which Dell has not received payment

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION). DELL'S RESPONSIBILITY FOR MALFUNCTIONS AND DEFECTS IN HARDWARE IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS WARRANTY STATEMENT. ALL EXPRESS AND IMPLIED WARRANTIES FOR THE PRODUCT, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN TIME TO THE TERM OF THE LIMITED WARRANTY PERIOD REFLECTED ON YOUR PACKING SLIP OR INVOICE. NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THE LIMITED WARRANTY PERIOD HAS EXPIRED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THIS LIMITATION MAY NOT APPLY TO YOU.

WE DO NOT ACCEPT LIABILITY BEYOND THE REMEDIES PROVIDED FOR IN THIS LIMITED WARRANTY OR FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY LIABILITY FOR THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES, FOR PRODUCTS NOT BEING AVAILABLE FOR USE, OR FOR LOST DATA OR LOST SOFTWARE. OUR LIABILITY WILL BE NO MORE THAN THE AMOUNT YOU PAID FOR THE PRODUCT THAT IS THE SUBJECT OF A CLAIM. THIS IS THE MAXIMUM AMOUNT FOR WHICH WE ARE RESPONSIBLE.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

How long does this limited warranty last?

This limited warranty lasts for the time period indicated on your packing slip or invoice, except for the following Dell-branded hardware:

- Portable computer batteries carry a 1-year limited warranty.
- Projector lamps carry a 90-day limited warranty.
- Memory carries a lifetime limited warranty.
- Monitors carry the longer of either a 3-year limited warranty or the remainder of the warranty for the Dell computer to which the monitor will be connected.
- Other add-on hardware carries the longer of either a 1-year limited warranty for new parts and a 90-day limited warranty for reconditioned parts or, for both new and reconditioned parts, the reminder of the warranty for the Dell computer on which such parts are installed.

The limited warranty on all Dell-branded products begins on the date of the packing slip or invoice. The warranty period is not extended if we repair or replace a warranted product or any parts. Dell may change the availability of limited warranties, at its discretion, but any changes will not be retroactive.

What do I do if I need warranty service?

Before the warranty expires, please call us at the relevant number listed in the following table. Please also have your Dell Service Tag or order number available.

Individual Home Consumers:	**U.S. Only**
Technical Support	1-800-624-9896
Customer Service	1-800-624-9897
Individual Home Consumers who purchased through an Employee Purchase Program:	
Technical Support and Customer Service	1-800-822-8965
Home and Small Business Commercial Customers:	
Technical Support and Customer Service	1-800-456-3355
Medium, Large, or Global Commercial Customers, Healthcare Customers, and Value-Added Resellers (VARs):	
Technical Support and Customer Service	1-800-822-8965
Government and Education Customers:	
Technical Support and Customer Service	1-800-234-1490
Dell-Branded Memory	1-888-363-5150

What will Dell do?

During the 90 days of the 90-day limited warranty and the first year of all other limited warranties: During the 90 days of the 90-day limited warranty and the first year of all other limited warranties, we will repair any Dell-branded hardware products returned to us that prove to be defective in materials or workmanship. If we are not able to repair the product, we will replace it with a comparable product that is new or refurbished.

When you contact us, we will issue a Return Material Authorization Number for you to include with your return. You must return the products to us in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk if the product is lost or damaged in shipment. We will return the repaired or replacement products to you. We will pay to ship the repaired or replaced products to you if you use an address in the United States (excluding Puerto Rico and U.S. possessions and territories). Otherwise, we will ship the product to you freight collect.

If we determine that the product is not covered under this warranty, we will notify you and inform you of service alternatives that are available to you on a fee basis.

NOTE: Before you ship the product(s) to us, make sure to back up the data on the hard drive(s) and any other storage device(s) in the product(s). Remove any confidential, proprietary, or personal information and removable media such as floppy disks, CDs, or PC Cards. We are not responsible for any of your confidential, proprietary, or personal information; lost or corrupted data; or damaged or lost removable media.

During the remaining years: For the remaining period of the limited warranty, we will replace any defective part with new or refurbished parts, if we agree that it needs to be replaced. When you contact us, we will require a valid credit card number at the time you request a replacement part, but we will not charge you for the replacement part as long as you return the original part to us within 30 days after we ship the replacement part to you. If we do not receive the original part within 30 days, we will charge to your credit card the then-current standard price for that part.

We will pay to ship the part to you if you use an address in the United States (excluding Puerto Rico and U.S. possessions and territories). Otherwise, we will ship the part freight collect. We will also include a prepaid shipping container with each replacement part for your use in returning the replaced part to us.

NOTE: Before you replace parts, make sure to back up the data on the hard drive(s) and any other storage device(s) in the product(s). We are not responsible for lost or corrupted data.

What if I purchased a service contract?

If your service contract is with Dell, service will be provided to you under the terms of the service agreement. Please refer to that contract for details on how to obtain service.

If you purchased through us a service contract with one of our third-party service providers, please refer to that contract for details on how to obtain service.

How will you fix my product?

We use new and refurbished parts made by various manufacturers in performing warranty repairs and in building replacement parts and systems. Refurbished parts and systems are parts or systems that have been returned to Dell, some of which were never used by a customer. All parts and systems are inspected and tested for quality. Replacement parts and systems are covered for the remaining period of the limited warranty for the product you bought. Dell owns all parts removed from repaired products.

May I transfer the limited warranty?

Limited warranties on systems may be transferred if the current owner transfers ownership of the system and records the transfer with us. The limited warranty on Dell-branded memory may not be transferred. You may record your transfer by going to Dell's website:

- If you are an Individual Home Consumer, go to **www.dell.com/us/en/dhs/topics/sbtopic_015_ccare.htm**
- If you are a Home Office, Small, Medium, Large, or Global Commercial Customer, go to **www.dell.com/us/en/biz/topics/sbtopic_ccare_nav_015_ccare.htm**

- If you are a Government, Education, or Healthcare Customer, or an Individual Home Consumer who purchased through an Employee Purchase Program, go to **www.dell.com/us/en/pub/topics/sbtopic_015_ccare.htm**

If you do not have Internet access, call your customer care representative or call 1-800-624-9897.

"Total Satisfaction" Return Policy (U.S. Only)

We value our relationship with you and want to make sure that you're satisfied with your purchases. That's why we offer a "Total Satisfaction" return policy for most products that you—the end-user customer—purchase directly from Dell. Under this policy, you may return to Dell products that you purchased directly from Dell for a credit or a refund of the purchase price paid, less shipping and handling and applicable restocking fees as follows:

- **New Hardware Products and Accessories** — All new hardware, accessories, parts, and unopened software still in its sealed package, excluding the products listed below, may be returned within 30 days from the date on the packing slip or invoice. To return applications software or an operating system that has been installed by Dell, you must return the entire computer. A different return policy applies to nondefective products purchased through Dell's Software and Peripherals division by customers of our Small and Medium Business divisions. Those products may be returned within 30 days from the date on the packing slip or invoice, but a fifteen percent (15%) restocking fee will be deducted from any refund or credit. The "Total Satisfaction" Return Policy and Software and Peripherals division return policy are not available for Dell | EMC storage products, EMC-branded products, or enterprise software.
- **Reconditioned or Refurbished Dell-Branded Hardware Products and Parts** — All reconditioned or refurbished Dell-branded server and storage products may be returned within 30 days from the date on the packing slip or invoice. All other reconditioned or refurbished Dell-branded hardware products and parts may be returned within 14 days of the date on the packing slip or invoice.

To return products, e-mail or call Dell customer service to receive a Credit Return Authorization Number within the return policy period applicable to the product you want to return. You must obtain a Credit Return Authorization Number in order to return the product. See "Contacting Dell" or "Getting Help" in your customer documentation (or **www.dell.com/us/en/gen/contact.htm**) to find the appropriate contact information for obtaining customer assistance.

You must ship the products to Dell within 5 days of the date that Dell issues the Credit Return Authorization Number. You must also return the products to Dell in their original packaging, in as-new condition along with any media, documentation, and all other items that were included in the original shipment, prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment.

Limited Warranty Terms for Dell-Branded Hardware Products (Canada Only)

What is covered by this limited warranty?

This limited warranty covers defects in materials and workmanship in your—our end-user customer's—Dell-branded hardware products, including Dell-branded peripheral products.

What is not covered by this limited warranty?

This limited warranty does not cover:

- Software, including the operating system and software added to the Dell-branded hardware products through our factory-integration system, or the reloading of the software
- Non-Dell branded and Solution Provider Direct products and accessories

- Problems that result from:
  - External causes such as accident, abuse, misuse, or problems with electrical power
  - Servicing not authorized by Dell
  - Usage that is not in accordance with product instructions
  - Failure to follow the product instructions or failure to perform preventive maintenance
  - Problems caused by using accessories, parts, or components not supplied by Dell
- Products with missing or altered Service Tags or serial numbers
- Products for which Dell has not received payment

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM PROVINCE TO PROVINCE. DELL'S RESPONSIBILITY FOR MALFUNCTIONS AND DEFECTS IN PRODUCT IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS WARRANTY STATEMENT, FOR THE TERM OF THE WARRANTY PERIOD REFLECTED ON YOUR PACKING SLIP OR INVOICE. EXCEPT FOR THE EXPRESS WARRANTIES CONTAINED IN THIS WARRANTY STATEMENT, DELL DISCLAIMS ALL OTHER WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. SOME PROVINCES DO NOT ALLOW THE EXCLUSION OF CERTAIN IMPLIED WARRANTIES OR CONDITIONS, OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY OR CONDITION LASTS. THEREFORE, THE FOREGOING EXCLUSIONS AND LIMITATIONS MAY NOT APPLY TO YOU.

WE DO NOT ACCEPT LIABILITY BEYOND THE REMEDIES PROVIDED FOR IN THIS WARRANTY STATEMENT OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY LIABILITY FOR THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES, FOR PRODUCTS NOT BEING AVAILABLE FOR USE, OR FOR LOST DATA OR LOST SOFTWARE. OUR LIABILITY WILL BE NO MORE THAN THE AMOUNT YOU PAID FOR THE PRODUCT THAT IS THE SUBJECT OF A CLAIM. THIS IS THE MAXIMUM AMOUNT FOR WHICH WE ARE RESPONSIBLE.

SOME PROVINCES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

How long does this limited warranty last?

This limited warranty lasts for the time period indicated on your packing slip or invoice, except that the limited warranty on Dell-branded batteries lasts only 1 year and the limited warranty on the lamps for Dell-branded projectors lasts only 90 days. The limited warranty begins on the date of the packing slip or invoice. The warranty period is not extended if we repair or replace a warranted product or any parts. Dell may change the terms and availability of limited warranties, at its discretion, but any changes will not be retroactive (that is, the warranty terms in place at the time of purchase will apply to your purchase).

What do I do if I need warranty service?

Before the warranty expires, please call us at the relevant number listed in the following table. Please also have your Dell Service Tag or order number available.

Individual Home Consumers; Home Office and Small Business Customers:	**Canada Only**
Technical Support and Customer Service	1-800-847-4096
Medium, Large, and Global Commercial Customers; Government, Education, and Healthcare Customers; and Value-Added Resellers (VARs):	
Technical Support	1-800-387-5757
Customer Service	1-800-326-9463
Government or Education Customers, or Individual Home Consumers who purchased through an Employee Purchase Program:	
Technical Support	1-800-387-5757
Customer Service	1-800-326-9463 (Extension 8221 for Individual Consumers)
Dell-Branded Memory	1-888-363-5150

What will Dell do?

During the 90 days of the 90-day limited warranty and the first year of all other limited warranties: During the 90 days of the 90-day limited warranty and the first year of all other limited warranties, we will repair any Dell-branded hardware products returned to us that prove to be defective in materials or workmanship. If we are not able to repair the product, we will replace it with a comparable product that is new or refurbished.

When you contact us, we will issue a Return Material Authorization Number for you to include with your return. You must return the products to us in their original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk if the product is lost or damaged in shipment. We will return the repaired or replacement products to you. We will pay to ship the repaired or replaced products to you if you use an address in Canada. Otherwise, we will ship the product to you freight collect.

If we determine that the problem is not covered under this warranty, we will notify you and inform you of service alternatives that are available to you on a fee basis.

NOTE: Before you ship the product(s) to us, make sure to back up the data on the hard drive(s) and any other storage device(s) in the product(s). Remove any confidential, proprietary or personal information, removable media, such as floppy disks, CDs, or PC Cards. We are not responsible for any of your confidential, proprietary or personal information; lost or corrupted data; or damaged or lost removable media.

During the remaining years following the first year of all limited warranties: We will replace any defective part with new or refurbished parts, if we agree that it needs to be replaced. When you contact us, we will require a valid credit card number at the time you request a replacement part, but we will not charge you for the replacement part as long as you return the original part to us within 30 days after we ship the replacement part to you. If we do not receive the original part within 30 days, we will charge to your credit card the then-current standard price for that part.

We will pay to ship the part to you if you use an address in Canada. Otherwise, we will ship the part freight collect. We will also include a prepaid shipping container with each replacement part for your use in returning the replaced part to us.

NOTE: Before you replace parts, make sure to back up the data on the hard drive(s) and any other storage device(s) in the product(s). We are not responsible for lost or corrupted data.

What if I purchased a service contract?

If your service contract is with Dell, service will be provided to you under the terms of the service contract. Please refer to that contract for details on how to obtain service. Dell's service contracts can be found online at **www.dell.ca** or by calling Customer Care at 1-800-847-4096. If you purchased through us a service contract with one of our third-party service providers, please refer to that contract (mailed to you with your packing slip or invoice) for details on how to obtain service.

How will you fix my product?

We use new and refurbished parts made by various manufacturers in performing warranty repairs and in building replacement parts and systems. Refurbished parts and systems are parts or systems that have been returned to Dell, some of which were never used by a customer. All parts and systems are inspected and tested for quality. Replacement parts and systems are covered for the remaining period of the limited warranty for the product you bought. Dell owns all parts removed from repaired products.

May I transfer the limited warranty?

Limited warranties on systems may be transferred if the current owner transfers ownership of the system and records the transfer with us. The limited warranty on Dell-branded memory may not be transferred. You may record your transfer by going to Dell's website:

- For Canada-purchased computers (in-country transfers) and to transfer from one customer to another, go to **www.dell.ca/ca/en/gen/topics/segtopic_ccare_nav_013_ccare.htm**
- For out-of-country transfers (outside of the original country of purchase), go to **www.dell.com/us/en/biz/topics/sbtopic_ccare_nav_016_ccare.htm**

If you do not have Internet access, call Dell at 1-800-847-4096 (Home Consumer customers) or 1-800-326-9463 (Corporate Commercial or Government customers).

"Total Satisfaction" Return Policy (Canada Only)

If you are an end-user customer who bought new products directly from Dell, you may return them to Dell up to 30 days after you receive them for a refund or credit of the product purchase price. If you are an end-user customer who bought reconditioned or refurbished products from Dell, you may return them to Dell within 14 days after the date on the packing slip or invoice for a refund or credit of the product purchase price. In either case, the refund or credit will not include any shipping and handling charges shown on your packing slip or invoice and will be subject to a fifteen percent (15%) restocking fee, unless otherwise prohibited by law. If you are an organization that bought the products under a written agreement with Dell, the agreement may contain different terms for the return of products than specified by this policy.

To return products, you must call Dell Customer Service at 1-800-847-4096 to receive a Credit Return Authorization Number. To expedite the process of your refund or credit, Dell expects you to return the products to Dell in their original packaging within 5 days of the date that Dell issues the Credit Return Authorization Number. You must also prepay shipping charges and insure the shipment or accept the risk of loss or damage during shipment. You may return software for a refund or credit only if the sealed package containing the floppy disk(s) or CD(s) is unopened. Returned products must be in as-new condition, and all of the manuals, floppy disk(s), CD(s), power cables, and other items included with a product must be returned with it. For customers who want to return, for refund or credit only, either application or operating system software that has been installed by Dell, the whole system must be returned, along with any media and documentation that may have been included in the original shipment.

The "Total Satisfaction" Return Policy does not apply to Dell | EMC storage products. It also does not apply to products purchased through Dell's Software and Peripherals division. For those products, please instead refer to Dell's Software and Peripheral's then-current return policy (see the following section, "Dell Software and Peripherals (Canada Only)").

Dell Software and Peripherals (Canada Only)

Third-Party Software and Peripherals Products

Similar to other resellers of software and peripherals, Dell does not warrant third-party products. Third-party software and peripheral products are covered by the warranties provided by the original manufacturer or publisher only. Third-party manufacturer warranties vary from product to product. Consult your product documentation for specific warranty information. More information may also be available from the manufacturer or publisher.

While Dell offers a wide selection of software and peripheral products, we do not specifically test or guarantee that all of the products we offer work with any or all of the various models of Dell computers, nor do we test or guarantee all of the products we sell on the hundreds of different brands of computers available today. If you have questions about compatibility, we recommend and encourage you to contact the third-party software and peripheral product manufacturer or publisher directly.

Dell-Branded Peripheral Products

Dell does provide a limited warranty for new Dell-branded peripheral products (products for which Dell is listed as the manufacturer) such as monitors, batteries, memory, docking stations, and projectors. To determine which limited warranty applies to the product you purchased, see the Dell packing slip or invoice and/or the product documentation that accompanied your product. Descriptions of Dell's limited warranties are described in preceding sections.

Return Policy

If you are an end-user customer who bought Dell Software and Peripherals products directly from a Dell company, you may return Dell Software and Peripherals products that are in as-new condition to Dell up to 30 days from the date on the packing slip or invoice for a refund of the product purchase price if already paid. This refund will not include any shipping and handling charges shown on your packing slip or invoice; you are responsible for those.

To return products, you must call Dell Customer Service at 1-800-387-5759 to receive a Credit Return Authorization Number. You must ship the Dell Software and Peripherals products back to Dell in their original manufacturer's packaging (which must be in as-new condition), prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment.

To qualify for refund or replacement, returned products must be in as-new condition, software products must be unopened, and all of the manuals, floppy disk(s), CD(s), power cables, and other items included with a product must be returned with it.

1-Year End-User Manufacturer Guarantee (Latin America and the Caribbean Only)

Guarantee

Dell Computer Corporation ("Dell") warrants to the end user in accordance with the following provisions that its branded hardware products, purchased by the end user from a Dell company or an authorized Dell distributor in Latin America or the Caribbean, will be free from defects in materials, workmanship, and design affecting normal use, for a period of 1 year from the original purchase date. Products for which proper claims are made will, at Dell's option, be repaired or replaced at Dell's expense. Dell owns all parts removed from repaired products. Dell uses new and reconditioned parts made by various manufacturers in performing repairs and building replacement products.

Exclusions

This Guarantee does not apply to defects resulting from: improper or inadequate installation, use, or maintenance; actions or modifications by unauthorized third parties or the end user; accidental or willful damage; or normal wear and tear.

Making a Claim

Claims must be made in Latin America or the Caribbean by contacting the Dell point of sale within the guarantee period. The end user must always supply proof of purchase, indicating name and address of the seller, date of purchase, model and serial number, name and address of the customer, and details of symptoms and configuration at the time of malfunction, including peripherals and software used. Otherwise, Dell may refuse the guarantee claim. Upon diagnosis of a warranted defect, Dell will make arrangements and pay for ground freight and insurance to and from Dell's repair/replacement center. The end user must ensure that the defective product is available for collection properly packed in original or equally protective packaging together with the details listed above and the return number provided to the end user by Dell.

Limitation and Statutory Rights

Dell makes no other warranty, guarantee or like statement other than as explicitly stated above, and this Guarantee is given in place of all other guarantees whatsoever, to the fullest extent permitted by law. In the absence of applicable legislation, this Guarantee will be the end user's sole and exclusive remedy against Dell or any of its affiliates, and neither Dell nor any of its affiliates shall be liable for loss of profit or contracts, or any other indirect or consequential loss arising from negligence, breach of contract, or howsoever.

This Guarantee does not impair or affect mandatory statutory rights of the end user against and/or any rights resulting from other contracts concluded by the end user with Dell and/or any other seller.

Dell World Trade LP
One Dell Way, Round Rock, TX 78682, USA

Dell Computadores do Brasil Ltda (CNPJ No. 72.381.189/0001-10)
Avenida Industrial Belgraf, 400
92990-000 - Eldorado do Sul – RS - Brasil

Dell Computer de Chile Ltda
Coyancura 2283, Piso 3- Of.302,
Providencia, Santiago - Chile

Dell Computer de Colombia Corporation
Carrera 7 #115-33 Oficina 603
Bogota, Colombia

Dell Computer de Mexico SA de CV
Paseo de la Reforma 2620 - 11° Piso
Col. Lomas Altas
11950 México, D.F.

Intel® Warranty Statement for Pentium® and Celeron® Processors Only (U.S. and Canada Only)

Intel's Three Year Limited Warranty

Limited Warranty
Intel warrants that its family of Pentium® and Celeron® processors, if properly used and installed, will be free from defects in materials and workmanship and will substantially conform to Intel's publicly available specifications for a period of three (3) years after the date the Pentium or Celeron processor was purchased (whether purchased separately or as part of a computer system).

If the Pentium or Celeron processor, which is the subject of this Limited Warranty, fails during the warranty period for reasons covered by this Limited Warranty, Intel, at its option, will:

• REPAIR the Pentium or Celeron processor by means of hardware and/or software; OR
• REPLACE the Pentium or Celeron processor with another Pentium or Celeron processor; OR
if Intel is unable to repair or replace the particular Pentium or Celeron processor,
• REFUND the then-current value of the Pentium or Celeron processor.

THIS LIMITED WARRANTY, AND ANY IMPLIED WARRANTIES THAT MAY EXIST UNDER STATE LAW, APPLY ONLY TO THE ORIGINAL PURCHASER OF THE PENTIUM OR CELERON PROCESSOR, OR PENTIUM OR CELERON PROCESSOR-BASED COMPUTER AND LAST ONLY FOR AS LONG AS SUCH PURCHASER CONTINUES TO OWN THE PROCESSOR.

Extent of Limited Warranty
Intel does not warrant that your Pentium or Celeron processor will be free from design defects or errors known as "errata." Current characterized errata are available upon request. This limited warranty is for purchasers in the United States and Canada only. The limited warranty does not cover any costs relating to removal or replacement of any Pentium or Celeron processors that are soldered or otherwise permanently affixed to your system's motherboard.

This limited warranty does not cover damages due to external causes, including accident, problems with electrical power, usage not in accordance with product instructions, misuse, neglect, alteration, repair, improper installation, or improper testing.

How to Obtain Warranty Service
To obtain warranty service for your Pentium or Celeron processor, you may contact your computer system manufacturer in accordance with its instructions, or you may contact Intel.

To request warranty service from Intel, you should call Intel at 1-800-628-8686 during the warranty period during normal business hours (Pacific Time), excluding holidays. Please be prepared to provide:
(1) your name, address, and telephone numbers;
(2) proof of purchase;
(3) this Intel warranty card;
(4) a description of the computer system including the brand and model; and
(5) an explanation of the problem.

[Note: The Customer Service Representative may need additional information from you depending on the nature of the problem.]

The replacement processor is warranted under this written warranty and is subject to the same limitations and exclusions for the remainder of the original warranty period or one (1) year, whichever is longer.

WARRANTY LIMITATIONS AND EXCLUSIONS
THESE WARRANTIES REPLACE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. INTEL MAKES NO EXPRESS WARRANTIES BEYOND THOSE STATED HERE. INTEL DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

SOME LAWS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES SO THIS LIMITATION MAY NOT APPLY TO YOU. IF THESE LAWS APPLY, THEN ALL EXPRESS AND IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIMITED WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. SOME LAWS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THIS LIMITATION MAY NOT APPLY TO YOU.

LIMITATIONS OF LIABILITY
INTEL'S RESPONSIBILITY UNDER THIS, OR ANY OTHER WARRANTY, IMPLIED OR EXPRESS, IS LIMITED TO REPAIR, REPLACEMENT OR REFUND, AS SET FORTH ABOVE. THESE REMEDIES ARE THE SOLE AND EXCLUSIVE REMEDIES FOR ANY BREACH OF WARRANTY. INTEL IS NOT RESPONSIBLE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, DOWNTIME, GOODWILL, DAMAGE TO OR REPLACEMENT OF EQUIPMENT AND PROPERTY, AND ANY COSTS OF RECOVERING, REPROGRAMMING, OR REPRODUCING ANY PROGRAM OR DATA STORED IN OR USED WITH A SYSTEM CONTAINING YOUR PENTIUM PROCESSOR. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

THE LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM JURISDICTION TO JURISDICTION.

Intel Pentium® and Celeron® Processors are backed by a three-year limited warranty.
Please refer to the reverse side of this card for complete warranty details.

Intel's Commitment to Quality
Intel is committed to producing the highest quality processors available. That's why we have hundreds of people dedicated to continuously improve our design, manufacturing, and testing technology.

We put every one of our Pentium® and Celeron® processors through a rigorous battery of tests during the design and manufacturing processes.

To verify that the new chip will correctly run the software written for Intel Architecture processors, a team of Intel engineers is dedicated to compatibility testing. In a state-of-art lab, this group runs an extensive set of operating systems, applications, network tests and stress tests repeatedly to ensure that the processor is compatible with representative software.

Just as importantly, we work with hardware and software companies in the computer industry to ensure that our processors are compatible with their products.

Additionally, a sampling of Intel processors are subjected to a rigorous "burn-in" test whereby the chip is operated at higher-than-normal temperatures and voltages. During this burn-in period, the processor experiences the equivalent of weeks of normal usage. These units are monitored for failures as part of our ongoing quality assurance process.

As a result, today's microprocessors from Intel are among the most reliable components in computers.

What are "Errata"?
Exhaustive product testing can highlight differences between the actual behavior of the microprocessor and its specifications. Sometimes the discrepancies are caused by a design defect or error, which we call errata. Rigorous validation identifies most errata during the development of the processor, but we do detect additional errata during the life cycle of a microprocessor.

When an erratum is identified, our engineers work to characterize it and find a solution. We work with system designers and software developers to ensure that the discrepancy does not affect their products. If necessary, special software or hardware solutions (sometimes known as "work arounds") are implemented in the system design to prevent computer users from encountering the problem. Errata may then be corrected in future revisions of the microprocessor.

No microprocessor is perfect, and Intel recognizes that some consumers want to know about any errata, whether or not the errata affect them. Intel makes documentation of all characterized Pentium and Celeron processor errata publicly available through our Technical Documentation Service.

At Intel, our goal is to make every computer user satisfied with his or her Pentium or Celeron processor. Should you have any questions, comments or concerns about your Intel microprocessor, please call us at 1-800-628-8686.

Index